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10 CENTS

Fisher and Kiser Twin Mohawk Racing Cars.

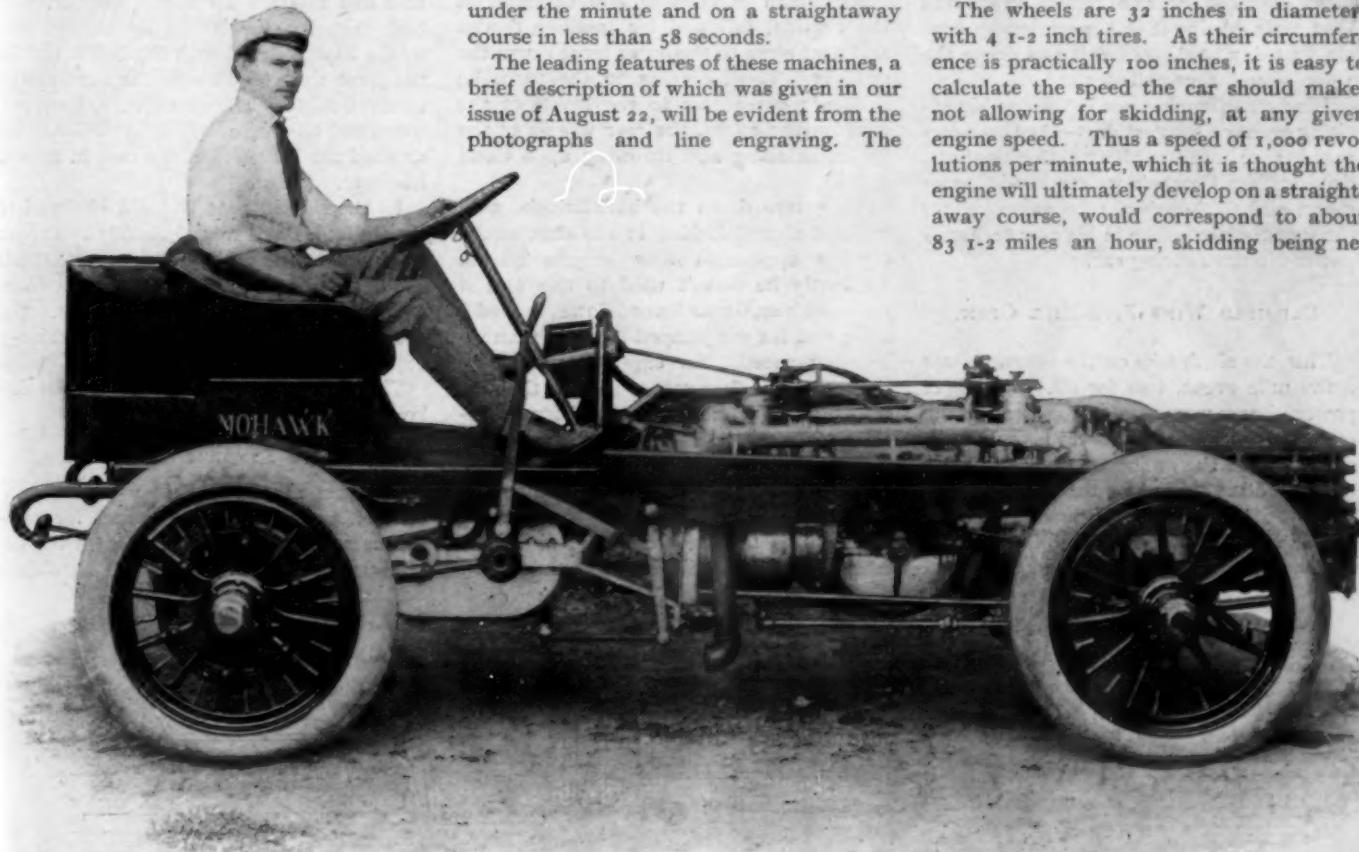
TWO powerful new racing cars of distinctly American type have just been completed and one of them made its first appearance in competition on the race track at the Columbus, Ohio, meeting last Friday. These two cars are of the same design and of an estimated horsepower of 80 each. They were built

Fisher's car has been given a number of private working-out trials on the Fair Grounds mile oval in Indianapolis, and at each test Carl Fisher lowered his previous time. He was timed by eighths of a mile, and last Thursday he covered an eighth on the straight in 7 1-5 seconds, indicating that a mile can be covered on a good track under the minute and on a straightaway course in less than 58 seconds.

The leading features of these machines, a brief description of which was given in our issue of August 22, will be evident from the photographs and line engraving. The

and a road gear for slow traveling. A friction clutch with two 20-inch flat discs affords a direct coupling from the first to the second sprocket on the first gear shaft; and when this clutch is engaged the low gear is out of action altogether. The drive is then as direct as possible, and the rear axle turns at the same speed as the engine.

The wheels are 32 inches in diameter, with 4 1-2 inch tires. As their circumference is practically 100 inches, it is easy to calculate the speed the car should make, not allowing for skidding, at any given engine speed. Thus a speed of 1,000 revolutions per minute, which it is thought the engine will ultimately develop on a straightaway course, would correspond to about 83 1-2 miles an hour, skidding being ne-



CARL FISHER IN HIS NEW 80-H. P. RACING CAR, FIRST USED IN PUBLIC LAST FRIDAY AT COLUMBUS, O.

especially for Carl Fisher, of Indianapolis, and Earl Kiser, of Dayton, who will drive the machines themselves. Fisher has already entered his for all the important race meets this fall, to be driven by himself or by his brother, Earl, or by a special operator to be employed.

engine lies horizontally, and has four 7 by 7-inch cylinders opposed in pairs. It drives the first shaft of the change gear by two sprocket wheels of equal size, and another pair of sprockets, also of equal size, completes the transmission to the rear axle. There are two forward speeds, a racing gear

glected. As in practice the rear wheels always skid somewhat at high speeds, this speed may not actually be attained.

The total weight of each machine is about 3,000 pounds. Though considerably heavier than the Ford-Cooper track racers, the Mohawk cars are much more

practical machines, as they have not only a gear for slow traveling, but irreversible wheel steering through worm and segment, regular spring rigging on rear as well as front axles, and, presumably, compensating gears on the rear axles as well. The

details of the valve arrangement and operating mechanism may be picked out from the drawing more readily, owing to all lines being solid, than if the numerous covered parts were indicated by dotted lines in the regular way.

Two-Days' Meet at Columbus, Ohio.

Exciting Events Contested by Oldfield and the Bullet. Fisher and his Mohawk, and Cooper and Cunningham on the Yellow "999" Stir 12,000 Spectators.

Special Correspondence.

COLUMBUS, O., Aug. 29.—Yesterday and to-day were "Bullet" days at the Columbus Driving Park Track and in the presence of 5,229 spectators on Friday and 7,000 to-day "Bullet III," under the steady hand of Barney Oldfield, vindicated herself in a measure for her failure to carry Percy Owen through the Gordon Bennett race in good time. Oldfield was entered to ride the 80-horsepower Bullet II, but it was used in the automobile parade Thursday night and, getting wet in the rain, short circuited or was otherwise so affected that after driving it in a warming-up heat the first day he discarded it and drove the 1,600-pound, four-cylinder car.

His first triumph came in the one big exciting event of the first day—the three-cornered race against Harry Cunningham, driving Tom Cooper's yellow Ford-Cooper racer, and Carl Fisher, who appeared for the first time in public in his new 80-horsepower Mohawk racing car.

OLDFIELD WINS FIVE-MILE OPEN.

This, the ninth race on the program, was a five-mile event, free for all. The three powerful cars were started together on the opposite side of the track from the grandstand, where the ominous rattle and bang of the sudden explosions that followed the waving of a red flag by Starter Anderson scattered precipitately the half hundred men and boys gathered around them and

struck awe to the heart of the photographer. As they gathered speed for a flying start Fisher forged ahead with Cunningham close behind and Oldfield two lengths in the rear. Though Oldfield shook his head as they crossed the tape, signifying his opinion that it was a bad start, there was no signal from the starter's gun to recall them, and, opening the throttles wider, they drive on, Fisher hugging the pole closely and taking the first turn only a few inches from the fence. Cunningham was inside and Oldfield, on the outside, followed his familiar tactics and kept close to the outer fence down the straight. Then, coming to the turn, he suddenly cut across to the inside of the turn on the curve, the rear wheels of the Bullet skidding and throwing up a cloud of dust.

They tore down the backstretch, with Oldfield almost hidden in the dust raised by his opponents four lengths ahead. Evidently he wasn't used to this and it annoyed him, for he leaned down, moved a lever and his car jumped forward with increasing speed. An express train from the south just then roared past on the railroad outside of the grounds and for a fraction of a minute the spectators were treated to an unexpected contest not down on the program, but the locomotive was outclassed and left behind.

The time for the first mile, as Fisher crossed the line in the lead, was announced

as 1:05. Oldfield was still in third place, in which position he finished the second mile, caught by the timers at 1:07. In the third mile the Bullet made an extra burst of speed which was opposed by the others and shortly after the three crossed the tape in the announced time of 1:02. Oldfield drew past Cunningham and Fisher and was at last in the lead. The fourth mile was done in 1:02 3-5. But, not satisfied merely to win, Barney put on every available ounce of power and rapidly drew away from his thundering opponents and made the last of the five miles in the fastest time of all—1:00 2-5—winning by almost a third of a mile in the total time of 5:20.

COOPER-OLDFIELD MATCH.

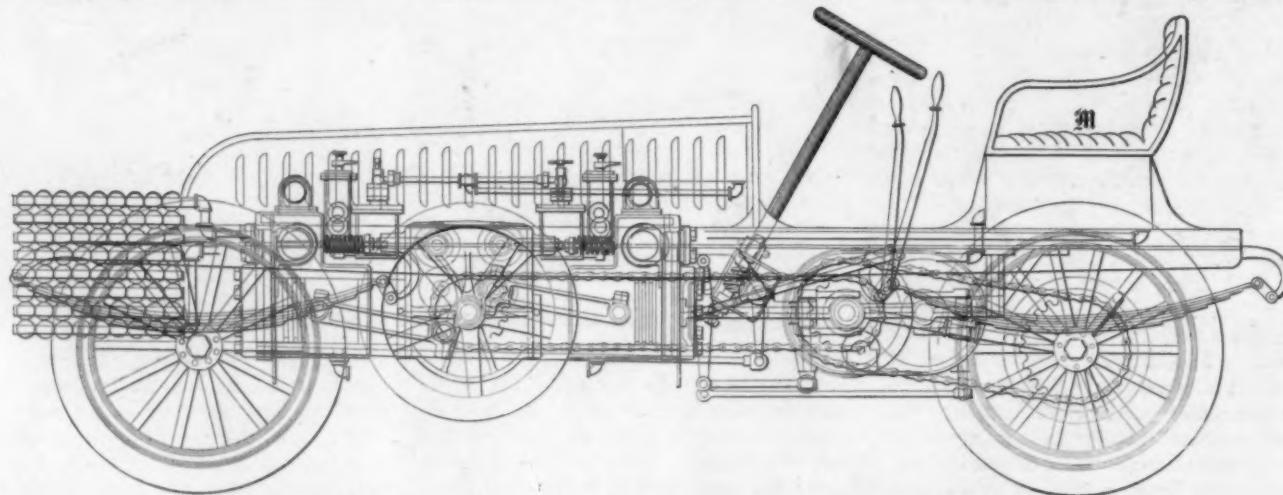
An accident was narrowly averted in the first heat of the five-mile match race between Oldfield and Tom Cooper. Barney was using the "Bullet II," and Cooper his 80-horsepower yellow car. The Bullet did not go well and Cooper had the race all to himself, turning off the miles successively in 1:03 2-5, 1:03 3-5, 1:02 3-5, 1:04 and 1:06 and winning in 5:19 2-5. In the last lap, after Oldfield had given up hope of winning and had reduced his speed, Cooper, who had gained a lap, came up behind and would have collided with the Bullet had he not given a sudden twist to the handles and swerved aside. The quick turn, however, wrenches off a tire, which exploded. He finished the last mile of the race in safety, however.

In the second heat Oldfield changed to the Bullet III and won as readily as Cooper had done in the previous heat. He made the best time of the day in the first mile, which was caught at one minute flat. The successive miles were done in 1:01, 1:01 1-5, 1:01 3-5, 1:01 3-5—total, 5:05 2-5.

The deciding heat was run on the following day.

THE MINOR EVENTS.

The first event on Friday was a novel contest. It was a two-mile race for gasoline cars belonging to members of the Columbus Automobile Club. The conditions



SIDE ELEVATION OF MOHAWK 80-H. P. RACER, SHOWING MECHANISM IN SOLID LINES.

required a standing start with "dead" motors and a full load of passengers, a stop within a specified distance at the end of the first mile, stopping of the engines, unloading of passengers, reloading, restarting, another mile run and stopping and discharging passengers.

There were five starters and the event was a lively and amusing scramble. Victory went to a Knox waterless car owned by Oscar S. Lear and driven by J. E. Cowan. The time was 5:45 3-5 for the two miles. The first car to finish was a Winton owned by F. E. Avery, but the passengers were too slow in alighting. A Toledo car belonging to W. H. Soule failed to come to a full stop within the given distance at the finish.

The second event of the day was a three-mile race for Cadillac cars. There were but two starters out of five entries. Of these, Oscar Lear's car failed to finish, so the race went to Dr. E. W. Schueller's Cadillac, driven by Joe Montgomery, which covered the three miles in 6:53 3-5.

R. S. Rhodes, in a White steamer, won the five-mile handicap for touring cars in 9:07 3-5, with W. H. Soule's Toledo gasoline tonneau second and F. E. Avery's Winton touring car third.

A five-mile race for steamers went to the White car entered by J. N. Hicks, in 9:17 2-5, while the White car owned by Dr. C. M. Taylor ran second.

Motor cyclists had their inning in a three-mile contest in which there were six starters. E. A. Neff, on a Thor, won easily in 4:39 1-5, with Frank Lowell, in a Buckeye, second and Ernest Wolumber, on a Marsh, third.

OLDFIELD WINS AGAIN SATURDAY.

The events of the day on Saturday were the ten-mile trial against time by Barney Oldfield, the three-cornered five-mile race between Oldfield, Carl Fisher and Harry Cunningham, and the final heat of the Oldfield-Cooper five-mile match, in which Cunningham substituted for Tom Cooper.

The deciding heat of the match came as the second event, following an obstacle race open only to members of the Columbus A. C., in which barrels, dummy figures and fragile bric-a-brac were liberally disposed upon the track, to be avoided by skilful driving. J. W. Jeffrey, in an electric; B. O. Williams, in an Olds, and J. W. Jeffrey, in a different electric, threaded the maze successfully in the order given.

When Oldfield, in the Bullet, met Cunningham on Cooper's yellow monster, there was fast time and excitement. But it only lasted a few minutes, as Barney won handily in 5:14 2-5. His times for the successive miles were: 1:03 4-5, 1:02 1-5 1:03, 1:02 4-5 and 1:02 3-5.

In his record trial Oldfield and the Bullet set the grandstand wild by doing the ten miles in 10:25 4-5. He used the 2,000-pound Bullet II. He kept close to the outer fence on the grandstand side and close to the pole on the back stretch.

The first mile was done in 1:10 4-5, and most of the rest in 1:02 and a fraction.

FISHER WINS WITH THE MOHAWK.

Carl Fisher's first victory in his new 80-horse-power car came in the best race of the meet, the five-mile three-cornered race against Oldfield and Cunningham, but the sweetness of it was partly lost owing to an accident to Oldfield that threatened to end disastrously and that put the Winton and its driver out of the contest. This was nothing less than the breaking of the rear axle at the last turn in the first lap.

At the start, Cunningham, on the pole, took the lead, with Fisher close behind and Oldfield third. On the first turn Fisher cut in to pass between Cunningham and the pole. Barely half a foot separated the giant cars as they made the turn, with Oldfield directly behind. There was a momentary suspense in the crowd as an accident seemed imminent, but Fisher slipped through successfully into the lead,

his opponent into the lead. Observing this, Fisher made another desperate attempt to drive through next to the pole, but there was less room than before and the spectators were keyed to a high pitch of dread until Cunningham, hearing Fisher coming, pulled out to give room for him to pass. The Mohawk slid through safely into foremost position, which it maintained to the end. Fisher's times were: third mile, 1:08; fourth, 1:07 1-5; fifth, 1:07 2-5. Total for the race, 5:35 1-5.

SATURDAY'S LESSER EVENTS.

Joe Montgomery, in Dr. E. W. Schueller's Cadillac car, finished first in the five-mile race for gasoline machines, but he was protested on the ground that the car was not equipped as required. The judges reserved decision.

There was a surprise in the five-mile handicap for steam machines, when victory went to an insignificant and curious looking little machine consisting of a pink running gear surmounted by a round red



EARL KISER IN HIS NEW MOHAWK RACING CAR WITH HOOD IN PLACE.

while Oldfield swung out to pass his two opponents on the outside.

The three cars were still bunched as they emerged from the last turn into the homestretch, and Oldfield again tried to pass on the outside. But as he turned the rear axle of the Bullet broke on the left side and the wheel wobbled dangerously as he came down the straight. He quickly noted it, however, and withdrew at the stables.

Then followed a beautiful race between Fisher and Cunningham. The Mohawk was but slightly ahead, pressed at every foot by the yellow Ford-Cooper. The time for the first mile was 1:05 3-5. Heavy dust rolled up from the track and almost obscured the two cars. As they came around to the tape at the finish of the second mile, done in 1:07, they were almost side by side, but in the third lap Cunningham drew up and crawled past

box covering the machinery. It was the Monitor racer built by the White Company. It won in 7:26 2-5.

The five-mile motor bicycle race was almost a repetition of yesterday's, E. A. Neff winning again on his Thor, in 7:51 2-5, with Frank Lowell second and E. S. Adams third.

The meet closed with a special two-mile match between Fisher and Cunningham, won without an effort by the latter in 2:15 1-5.

A patent has been applied for in the United States on the Starley motor bicycle—illustrated and described in *THE AUTOMOBILE* for August 8, by the builders, Starley & Co., of Coventry, who write that the examiner has reported that the claims have been allowed and that the letters patent will issue in due time. Starley & Co. may send over one of these machines in October.

Use of Mineral Oil in Road Improvement.*

BY JAMES W. ABBOTT.†

Public attention was first called to the utility of crude petroleum oil in road betterment through experiments made by the county of Los Angeles in California in 1898, where six miles of road were oiled in that year under the direction of the supervisors. The sole purpose of this work was to lay the dust, which, churned beneath the wheels of yearly increasing travel during the long dry seasons in that region, had become a most serious nuisance.

The following year this mileage was a little more than doubled in that county, and other counties in California also began experiments along the same line.

From the very first the results obtained were so astonishingly successful that the practice rapidly increased. It spread through every county in Southern California, and then began to work north. Now, after five seasons, it has extended from near the Mexican line, on the south, to Durham, in Butte County, on the north, a stretch covering sections of quite widely differing climatic conditions, with an aggregate of about 750 miles of county roads and city streets oiled for one or more years. Oil has been used on the principal driveways of Golden Gate Park, San Francisco. The mountain stage road into the Yosemite National Park has been oiled for a distance of thirty miles, from its initial terminus at Raymond to eight miles above Wawona.

The practice has now passed the experimental stage. More than twenty-five counties in that State have already used it, and others are preparing to do so during the season of 1903.

Thus far California is the only State which has actually adopted the practice. It has been tried to a very limited extent in Texas, and a few isolated experiments have been made in Pennsylvania, New Jersey, Indiana, Colorado, and the District of Columbia. Within the past year also a few experiments have been reported from England, France, and Switzerland.

ORIGINAL OBJECT OF USE OF OIL ON ROADS.

As already stated, the original motive for the use of crude oil on roads was to lay the dust. Wherever oil has been tried this purpose has invariably been accomplished, regardless of methods adopted or variety of oil used. On all kinds of roads where it has been applied the dust has ceased absolutely for at least an entire season after its application, and, if renewed a second year, has been abated for that year also and the following, whether then treated or not. In Southern California all unite in saying that the great bane of life—dust—passed away wherever the first application of oil was

made. The dust raised by passing travel no longer comes in at windows or destroys the products of field and orchard for considerable widths on each side of the road, as it formerly did. The report of its effectiveness as a dust layer is just as positive and enthusiastic from all sections which have made the experiments.

BENEFITS FROM THE USE OF OIL.

In California it was soon learned that, incalculably valuable as it was, the laying of dust was not the only or even the most extraordinary result obtained. It was found that when oil was applied it immediately began to bind together all the loose particles constituting the road surface, whether clay, sandy loam, loose sand, gravel, or the fine material on the top of macadam. A tough stratum formed, resembling an asphalt pavement. Roads built on drifting sand or clayey dust, no matter how deep, where trotting with a buggy was impossible and for a pair of strong horses to pull a ton was a very laborious process, became indurated, resili-ent, and firm, so that driving teams could trot with ease and the same pair of horses pull two and one-half tons more comfortably than they formerly did the one ton. Of course, these results were not fully obtained immediately, but they never failed to follow persistent treatment with oil.

At first, while this oiled surface stratum was thin, it was often broken through, especially in wet weather, but proper repairs and subsequent applications of oil thickened and strengthened it until it would at all times effectually withstand the heaviest and most continuous travel.

Running south from the railroad track in the town of Chino, San Bernardino County, Cal., is a piece of road over which every season nearly 40,000 tons of sugar beets are hauled on their way to the factory often averaging 750 tons a day. The foundation of this road is a loose sand, and it has been surfaced with a material containing some clay. Formerly the loaded wagons often stalled and had to be dug out. Now, after three seasons of treatment with oil, the road is as easy to drive over as a good city street, and effectually sustains the heavy travel, although the majority of the wagons used on it have narrow tires. The benefits of the oil were experienced immediately after the first application was made, but the surface stratum under successive treatments grew thicker and firmer until the road has become virtually perfect.

In another place in the same county, several miles distant from the one just described, the road runs over drifting sand just like the worst to be found on Cape Cod, in Massachusetts. (See photographs of sandy road.) It has been treated for two seasons with oil, and is now as good as

the other. Both pieces of road were visited and carefully examined by the writer, who can testify to the almost incredibly satisfactory results obtained.

TESTS OF OILED SURFACES BY RAINFALLS.

All semi-arid regions are subject to very heavy rainfalls at times, which are generally called waterspouts. In California these have in many places subjected oiled road surfaces to the severest possible tests. Mr. Theo. F. White, a civil engineer, one of the supervisors of San Bernardino County, a man who has had a great deal of experience in oiled roads and made them a special study, tells of one storm occurring in that county in which ten and one-half inches of rain fell, six inches of it in a single night. He says:

"The whole country was flooded and it gave us a good test of our oiled roads. There is a road running into San Bernardino on a grade of about 6 per cent., about 300 or 400 feet from a bench down into a creek bottom. The road had been oiled a second season and there was a good oiled surface. The water rushed down the middle of that road, because the ditches could not carry such a great volume of it, and it did not make a scratch on the road; but a half mile south there was a road of about the same grade which was so badly washed that it could not be used until it was repaired—a road that was not oiled. Between Pomona and Freeman there was a great quantity of water came from a canyon and struck the oiled road at right angles at one point. It came from the west, and on the east side of that road there was a margin of six or eight inches of the surfacing material that the oil had not touched. The rain passed over the oiled surface, and when it came to that which was not oiled it cut it right out. Upon the same road within the city limits of Pomona the road was surfaced with decomposed granite, packed down hard, and a very nice road during the summer, but it had not been oiled. The same storm cut it all to pieces. On one stretch of a quarter of a mile the road material was fairly washed out into the fields alongside the road."

THEORETICAL OBJECTIONS TO USE OF OIL.

When they first began to use oil on roads in California there was much speculation as to whether it would not be found objectionable; but when properly applied, and suitable precautions were taken not to use the road before it was ready, the theoretical objections vanished. When oil was placed upon the surface of the road, if vehicles were allowed to run over it before it had sunk in and become thoroughly incorporated with the road material, the wheels picked up the oil and threw it in all directions, injuring clothing and everything else of a delicate nature upon which it fell. After experience had taught how to avoid this, no further serious difficulties manifested themselves.

*From year book of the United States Department of Agriculture for 1902, not yet issued.

†Special Agent for the Rocky Mountain and Pacific Coast Division of the Office of Public Road Inquiries.

There does not appear to be such a thing as dust from an oiled road. Of course, dust from outside may blow onto an oiled road, but this soon adheres to the oiled surfaces and ceases to rise.

To determine whether oiled road material would produce a stain, the writer repeatedly scraped up some from the surface of a road which had been treated some months before and placed it in a clean white handkerchief. Taking the corners of the handkerchief in the left hand, the ball of dirt was turned by the right hand, so as to compress the contents as the housewife does her fruit pulp when making jelly. After turning until the compression was carried as far as the strength of the handkerchief would permit, the ball was manipulated by the right hand for a moment or two. Then retaining one corner of the handkerchief in the left hand, the others were dropped and the handkerchief thoroughly shaken. None of the

ever experienced with the surface of an oiled road.

For a short time after oil is applied there is a very perceptible odor, which soon disappears almost entirely. While it lasts it is not essentially disagreeable, and many people rather like it.

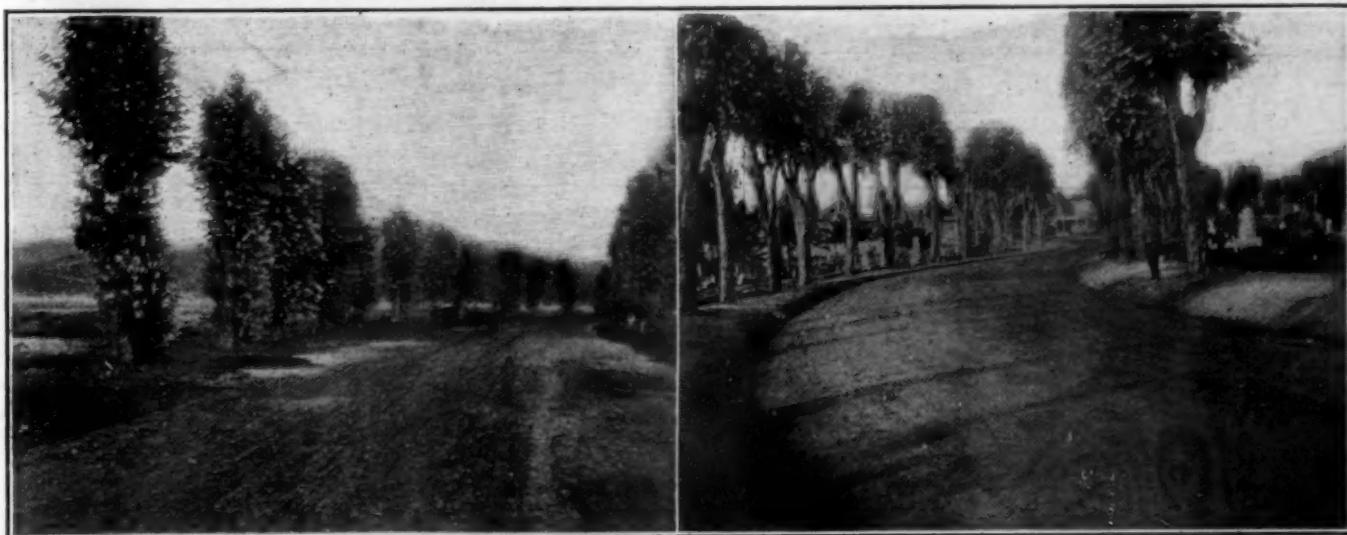
An incidental advantage of oil on roads is the help to the eyes. The reflection of the sun from white road surfaces and the dust blown into the eyes are both very trying. Oiling gives the road a seal-brown color.

In California oil is found to be very effective in preserving the planking of wooden bridges. A liberal coat is first given to the wooden floor, and upon this is spread a layer of sand about one inch deep. A very light springing of oil is then given to the sand, which binds together and forms a layer that is not only waterproof but protects the wooden surface from direct contact with the wheels of vehicles.

affine base, and those of California and Texas have an asphalt base. The specific gravity of an oil is expressed in degrees Baumé.*

All petroleums will lay dust, but asphalt is required to bind together the loose particles of a road surface. As soon as petroleum is put on a road all the lighter hydrocarbons which it contains begin to evaporate whenever the temperature is reached at which they vaporize. After a time nothing but the heavier ones remain. Properly speaking, asphalt is a solid, and maltha is the more correct name for the liquid, which is actually asphalt dissolved in lighter hydrocarbons. But in practice it is customary to designate as asphalts all the heavy liquids derived from natural deposits, which are composed of hydrogen and carbon.

Asphalt is itself a compound, its principal constituents being petrolene and asphaltene. Asphaltene is a solid, and ex-



Road in Evergreen Cemetery, Los Angeles, Cal., in Natural State.

Same Road Showing Newly-Finished Oiled Surface.

EFFECT OF TREATING DUSTY ROADWAY WITH CRUDE PETROLEUM, SHOWN BY PHOTOS TAKEN BEFORE AND AFTER.

material adhered to the handkerchief and no discoloration could be detected.

The mud from oil-treated roads, after the oil has become thoroughly diffused through the material, does not appear to be more objectionable than ordinary mud.

EFFECT ON RUBBER TIRES.

Diligent inquiries about the effect of oiled roads on rubber tires failed to disclose any complaints, except in cases where the tire had come in direct contact with the oil. So far from being injurious, the claim is made by some that the resiliency of an oiled road surface and the protection against the sharp edges of sand and gravel increase the life of rubber tires very materially.

It has not been uncommon for asphalt pavements in cities to become softened by the heat of the sun to such a degree as to be injured by the wheels of heavily-loaded wagons. No difficulty of this character is

The growth of oil in popular favor in Southern California has been steady and rapid. Many of those who have had experience with it have come to regard its use in a dry region as the most important discovery ever made in road making. Quite a considerable number of people have said to the writer, "We could not go back to the old conditions; if we had to give up our oiled roads we would move away."

VARIETY IN COMPOSITION OF CRUDE OILS.

The chemical composition and character of crude petroleum oils vary greatly in the different localities where the oils are found. They are all complex hydrocarbon compounds. The more carbon they contain the greater their specific gravity and the higher the temperature required to evaporate them. The petroleums of Russia belong generally to what is known as the naphthalene series. Those of Pennsylvania, Ohio, Colorado, and Wyoming have a par-

tremely brittle. Petrolene is a thick, black, viscous liquid, which volatilizes only when it reaches a temperature of 450° F., and therefore remains stable under all atmospheric conditions. We do not know just what is the separate effect of the dissolved asphaltene and petrolene, but we

*Baumé was the name of a man who devised an apparatus for determining the specific gravity of liquids. This apparatus for liquids lighter than water consists of a hollow glass stem with a bulb blown in the middle so as to insure buoyancy, and another bulb in the bottom to hold mercury, like the bulb of a thermometer. A short distance above the upper bulb Baumé made a mark and then poured sufficient mercury into the lower bulb so that the apparatus would sink in a 10 per cent. solution of salt and water to that mark. The apparatus (called a hydrometer) was then immersed in pure water, which is much lighter than salt and water, and of course the hydrometer sank deeper. The point to which the stem sank in the water was carefully marked. The distance between these two marks was graduated into ten parts, called degrees, the bottom zero, the upper one 10. Water is therefore 10 degrees Baumé, written "°B. 10" or "10° B."

do know that the asphalts which contain them bind the loose particles of the road surface together into such a crust as has been already described.

In the California asphalts the asphaltene and petrolene are found combined in very variable proportion. In the petroleums which contain them the combinations of all the hydrocarbons differ, not only in the same immediate oil field, but in the separate strata and even in the same stratum.

The very heaviest of the oils have almost the specific gravity of water, while a naphtha may be 75° B., or even lighter.

From the very beginning of the use of crude oil for roads in California it seems to have been understood that it was the asphalt in the oil which acted as the binder, and consequently they have always sought very heavy oils for that purpose. It might naturally be supposed that the heavier the oil the greater the percentage of asphalt. While this is approximately true, it does not necessarily follow. A crude oil is a complex mixture of light and heavy hydrocarbons, and its resultant gravity depends upon the amount of each kind which it contains.

The following was compiled from the notes of eleven analyses of crude oils made in California by D. B. W. Alexander, now the Denver chemist of the Colorado Paving Company. The original determinations covered many other data, but in the table only the degrees Baumé and the percentage of asphalt are shown.

ANALYSES OF CRUDE OILS.

Degrees Baumé.	Per cent. asphalt.	Degrees Baumé.	Per cent. asphalt.
10.4	64.1	15.7	39.9
12.2	45	19	28
13	61	19.3	32.8
13.75	59	23	25.4
15.4	32.1	23	43
15.5	50.2		

All of these oils doubtless contained a small amount of mineral matter which affected the specific gravity and disturbed the relation between it and the asphalt contained.

The above table shows that in selecting a petroleum for road purposes the specific gravity alone is not a sure guide. It also shows that the California practice of selecting an oil of 12° B. to 14° B. can be depended upon for good results.

Mr. L. B. DeCamp, of San Francisco, suggests the following as a crude test used by him; it is probably closer than the Baumé measurement:

Pour a definite amount of crude petroleum into a graduated glass and add an equal amount of refined petroleum. Stir thoroughly together and add to the mixture 2 per cent. of commercial sulphuric acid. Again stir thoroughly and the asphalt will precipitate to the bottom. The percentage which it represents of the original amount of oil can be measured by the graduations on the glass.

THE OILS USED ON ROADS.

Instead of crude oil, asphalt residuums, from which the lighter products have been distilled, have been much used on roads in California, but no observations have been made to determine whether the results have been more satisfactory in proportion to the amounts used.

Texas oils carry on an average a much lighter percentage of asphalts than California oils.

In the few experiments made with oils on roads in the United States outside of California and Texas a residuum from paraffine crude oils has generally been used of about 26° B. While these experiments have always been successful in laying dust, they have not been followed up with sufficient persistency to demonstrate any efficacy of this material as a road maker. It is known that many of the hydrocarbons will under certain conditions form a chemical union with oxygen and nitrogen, producing a small percentage of asphalt. It is possible that if roads were repeatedly sprinkled with any crude oil it might be found in time that the oxygen and nitrogen of the atmosphere had united with them and produced some asphalt of enduring value to the road.

The European experiments were made upon macadamized roads and were designed solely with a view to laying the dust. In England they used a crude petroleum from Texas and on the Continent Russian oils.

METHODS OF APPLYING OIL TO ROADS.

Without precedent anywhere for a guide, naturally the first experiments along this line were tentative and differed in method according to the theories and ingenuity of those intrusted with their execution. For a time it was quite strenuously argued by many that it was the better practice to apply the oil to a road surface while it was moist like an orchard soil when it works well. It was contended that the water and the lighter oils evaporating together would effect a more desirable result than could be secured without water. This view is now unanimously rejected by all experts in road oiling. While all agree in advocating liberal sprinkling in preparing the road surface, the aim is to let the water all evaporate before the oil is applied.

There has been a very spirited controversy over the question, "Must oil be artificially heated to produce the best results?" Until within the past year the majority of the practical oiled road makers insisted that it must; but experience with oil at normal temperature (always spoken of as "cold oil") has resulted in increasing the number of those who advocate doing away with heating devices. It is universally conceded that the hotter the oil can be applied the more quickly it becomes absorbed and incorporated with the road material. Heat thins the oil and increases its tendency to penetrate a firm road covering.

The principal argument against heating is its cost. It requires special apparatus, and the process involves some expense. If the heating apparatus is stationary, the oil must go to it to be heated and hauled from it onto the road treated, no matter how far away.

These stationary heating plants have always been erected at some railroad siding. If possible a siding has been selected above the general surface. A receiving tank, large enough to hold the contents of one tank car, was placed beside the track, low enough so that oil from the car would all run into it by gravity. A heating tank was then placed above the receiving tank, and at sufficient elevation so that the heated oil would run by gravity into the distributing tank wagons. A stationary boiler was installed to force steam at high pressure through steam coils in the heating tank, from which the steam exhausted into a feed-water tank. A pump to raise oil from the receiving tank to the heating tank, a feed pump, and a structure to house everything in, completed the installation. The first cost of such a plant was between \$1,000 and \$1,500.

At Golden Gate Park, in San Francisco, Superintendent John McLaren uses two distributing tank wagons of 650 gallons each, which are both equipped with steam coils, so that the oil in one can be heated while the other is distributing. Steam from the boiler at the pumping station is used. Of course this necessitates hauling the oil to this point to be heated. In some places a portable traction engine has been used. This, with coils in the distributing tanks, allows the oil to be delivered by the cars at the siding nearest where the work is being done, and reduces the heating cost to a minimum. But the tendency in oiled-road practice is toward relying for heat upon the sun only.

PREPARATION OF THE ROAD.

When a road is to be treated it must first be prepared to receive the oil. It should receive a crown of about a half inch to the foot; on a sixteen-foot roadway this would leave each side four inches lower than the center. Careful attention should be given to the drainage, so that water can quickly run off and not soak into the foundation of the road from the sides. The oil covering when finally made will be impervious to water, but if the foundation is water soaked it loses its firmness and ability to support the road surface under travel, and causes it to break through in spots.

After the road has been properly shaped it should be given a thorough soaking with a road sprinkler and rolled with a light roller. The purpose of this is to insure uniform consistency and a firm foundation. It should then be left undisturbed, if possible, until the water dries out. Many roads have been oiled and excellent results obtained without any wetting or rolling, but the practice described is the best where the facilities are obtainable.

A soil which after being wet tends under travel to pack firmly, but is still sufficiently porous to let water drain through, is ideal for treatment with oil. A clay that bakes and then pulverizes into fine dust under the wheels will only give good results when some material is added, as explained later.

After the road surface has become dry it is well, if feasible, to run a sharp-toothed harrow over it, so as to loosen it to a depth of three inches. The aim is to secure an oil crust three inches thick. If the road surface can be made to absorb oil to that depth, that is the simplest way to get the crust. If this surface is hard and will not readily yield to the harrow for a depth of three inches, the practice is to build it up by adding material after the oil is applied.

MACHINES FOR DISTRIBUTING OIL ON ROADS.

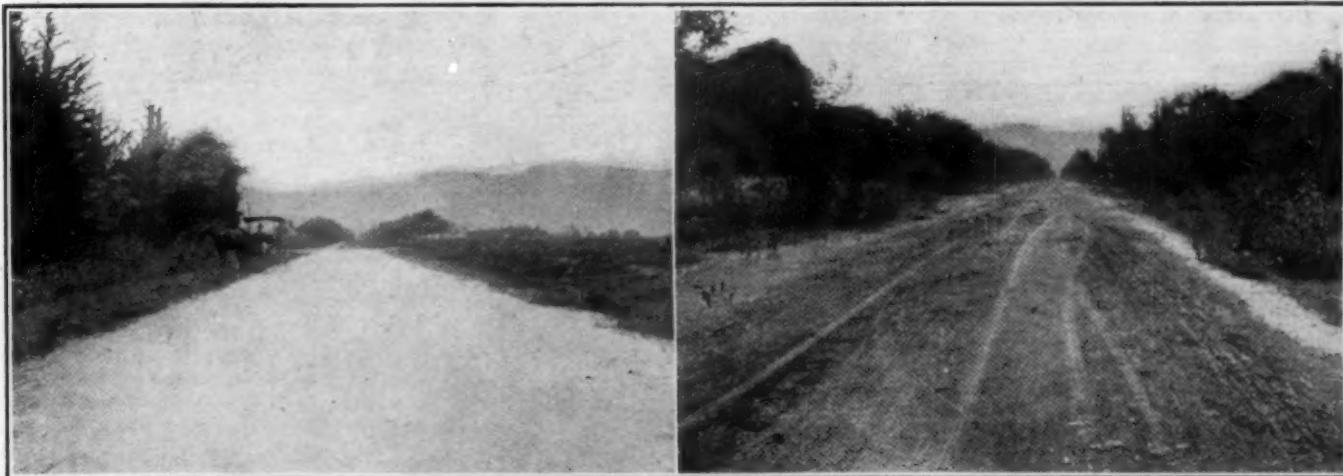
The next process is the putting on of the oil. If travel can be kept entirely off the road, then the full width should be finished before vehicles are allowed on it. If that is impossible, then a strip at a time must be

through a flexible hose. It has an oil reservoir and three sets of fingers. The first set makes furrows just ahead of the oil-discharging pipes. The second set of fingers (or curved teeth) covers up the oil, and the third set stirs up the combination of oil and dirt. There is also a drag to crush any globules or chunks which may tend to form. When the oil is being distributed the second and third sets of fingers and the drag are raised from the ground by hooks. After the oil is distributed, this machine is detached from the tank, the slip tongue put in, and the machine dragged back and forth over the oiled road until the oil has been thoroughly incorporated with the road material.

In other distributors, like the White and the Glover, the oil is conducted from the tank by a forked tube into a large bore pipe about six feet long, so attached to the framework of the wagon that it hangs crosswise of it and about six inches above the ground, just behind the rear wheels. The pipe has a number of openings on its

described. Other ways are as follows: A sharp-toothed harrow, preferably the ordinary steel-lever kind, with the teeth slanted back, is dragged along and then across the road until further stirring is unnecessary. In Golden Gate Park men follow the distributor with rakes and stir the material entirely by hand. Special machines called "stirrers," to be drawn by horses, are made, in which the teeth have an oscillating or cross motion when the machine is being pulled forward. Another machine, which is said to be especially valuable when the ground is cold or wet, is the Fitzgerald roller, provided with alternating rows of inch-square steel prongs six inches long.

If after the stirring process some spots appear sticky and others dusty, it shows too much or not enough oil. Over the sticky places should be thrown some of the unoiled road material and this stirred in with a hand rake. The dusty spots must be treated with more oil and stirred. The whole work should show uniform results.



Road Through Deep Sand, Chino, San Bernardino County, Cal.

EFFECT ON SAND ROAD OF TREATMENT WITH CRUDE PETROLEUM, SHOWN BY COMPARATIVE PHOTOGRAPHS.

Same Road After Oiling, Showing Hard, Smooth Crust.

treated, and travel meanwhile confined to the other strip.

The oil is put on by means of a longitudinal tank mounted on wheels like an ordinary sprinkling wagon. Four horses can readily pull one holding from 800 to 1,000 gallons. To the rear of this tank is attached the device which lets the oil out onto the road. Attempts have been made to use an ordinary sprinkling wagon, but with very poor success. It has been found impossible to get any regulation to the discharge. When the tank was full it would discharge much faster than when it was partly full. There was a tendency also for the center of the strip treated to get too much oil and the edges not enough. If hot oil was used, the spray tended to cool it before it reached the ground.

In what is known as the De Camp machine the distributor proper is mounted on separate wheels and coupled to the rear of the tank wagon, the slip tongue being removed. The oil runs from the tank

under side through which oil can run out. These openings are uniform distances apart, in sets, and all controlled by valves which can be opened either by the driver or by a man who has a seat for the purpose on the rear of the tank. The various levers, cranks, connections, and fittings in all the machines are such as experience has suggested, and the machines have been evolved by degrees. By having the openings in sets any width strip can be oiled which is a multiple of eighteen inches.

Whatever form of distributor is used the driver starts his team on a walk, the valves are opened, and the oil, running through openings so close together, reaches the ground in a sheet practically unbroken for the width treated. The aim is to regulate the flow so as to spread all the oil the ground will absorb.

The next process is to stir up the newly-oiled surface and work the oil and road material together. How this is done with the De Camp machine has already been

After twenty-four or forty-eight hours the road can be traveled over.

SANDING THE ROAD.

The practice above described is that followed when the road material is sufficiently porous for oil to readily mix with it. If it is hard, like baked clay or macadam, and can not be readily stirred, the practice is very different. For such conditions the oil must be put on when the road surface has been heated as much as possible by the sun. If the oil itself can be first heated, so much the better. In fact, the more heat there is in the oil, the ground, and the atmosphere when oil is applied, the quicker the results obtained, whatever process is used. Some of the oil will sink into the hard covering; the rest will remain upon the surface and must receive a coating of sand or fine gravel. The oiled crust which results from such treatment will be partially the top surface of the original road and partially the new envelope. This can still be further built up by another oiling

and another layer of sand. This sand (or fine gravel or quite sandy loam) can be applied with a shovel by a man who rides on a load of sand driven beside the oiled strip. Practice will bring considerable dexterity in throwing out sand in thin strips with a shovel.

The White sanding machine is a device for spreading the sand more uniformly. It consists essentially of a hopper and a corrugated drum mounted on an axle on two wheels and with a castor wheel in front. The sand falls onto the drum and runs out in a sheet whose thickness is regulated by appropriate mechanism. In practice, it is attached by a sort of triangular bracket to a wagon loaded with sand, carrying two men facing each other, who shovel the sand into the hopper. The wagon runs beside the oiled strip. The hopper runs on the sheet of sand which has fallen from it. When the wagon is empty, it is disconnected from the machine and replaced by a loaded wagon.

Some macadam roads in California which have been treated in this way are conspicuously excellent.

After an oiled road has been traveled a

application. On the second application the crust which has begun to form should not be disturbed, but after all the oil sinks in that will, a layer of sand should be sprinkled on top. In this oiled crust the bottom will be made from the clay dust and the top mostly from the added sand, while the middle will be a mixture of the two.

In the first experiments a part of the oil was generally put on the first year, and the crust was completed the second or third year. The first year the thin crust was often broken through and a hole was left in the road.

After the oiled crust has once been properly formed, all the oil required will not exceed twenty-five barrels to the mile for repairs in each subsequent year.

One of the accompanying illustrations shows oiled crusts taken from three oiled roads in Chino, San Bernardino County, Cal., where a different practice was followed in each case. In all the substratum was a loose, sandy loam, sand predominating. All the roads were formerly very dusty, loose, and full of "chuck holes" in the dry season, making the hauling of

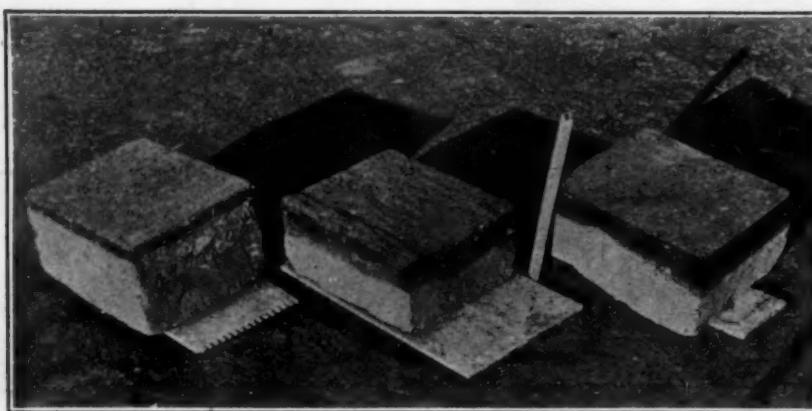
applied at an interval of about eight weeks. It will average somewhat over two inches in thickness, and is the best road of the three.

REPAIRS TO OILED ROADS

With an oiled road, as with macadam or any other kind, it is the constant vigilance and the stitch in time that accomplishes the best results in maintenance. It requires persistent attention. If the crust gets broken it should be repaired at once. For winter repairs it is well to mix in the fall a lot of sharp sand or fine gravel with oil, stirring it all up with a hoe in a mortar box as mortar is mixed, and being careful not to put on so much oil that any will run away when the mixture is left standing. When a hole starts, clean it out thoroughly with a hoe or brush broom, fill the hole to a little above the adjoining surface with some of the oil and sand mixture, and thoroughly ram it.

Most of the distributors which are now made have a short hose attachment, with gate and nozzle and shut-off valve for use in repairs. When a patch appears to have too little oil, or a hole needs repairs and no oil mixture is at hand, a little oil, with this hose, can be put just where most needed, and with a rake, hoe, shovel, and rammer the difficulty is quickly remedied. In making repairs when fresh material is required, care should be exercised not to use any which has been subjected to travel and has refuse in it.

It frequently happens that travel follows the same track, and the narrow tires and feet of the horses wear depressions. It is important to correct these and reshape the road at least once a year. It has been found that an ordinary blade road grader will not do this successfully, but will tear up the oiled crust and destroy it. The White smoother is a device for shaving off elevations and filling up depressions in an oiled crust. It consists of a pair of runners sixteen feet long and four feet apart. Between them, at the front end, are set on a slant backward obliquely to the left three rows of three-quarter-inch steel harrow teeth, so adjusted that they shave along lines just one inch apart. As their edges get dull the teeth can receive a quarter or half turn and their height from the ground can be regulated. There is also a blade set obliquely which scrapes off the shavings made by the harrow teeth. These shavings, confined by the two runners and the blade, naturally seek the depressions. In the left-hand runner is an opening, through which any surplus shavings are forced out toward the center of the road, thus tending to raise the crown. There are wheels on the sides upon which the machine, with runners raised from the ground, travels when being moved from one place to another, and a steering gear by means of which the operator readily controls its direction. A road reshaped with this machine, treated with a light sprinkling of oil and a thin sheet of sand and rolled,



SECTION OF OILED CRUSTS FROM THREE ROADS IN CHINO, CAL.

few weeks it is an advantage to roll it with a light roller; but the best rolling effect is obtained if as soon as travel begins on the newly-oiled road a wagon is used with broad tires (at least six inches), with front axle shorter than the rear by an amount nearly equal to double the width of the tire.

QUANTITY OF OIL REQUIRED.

In California, where the aim is to always use an oil containing as much asphalt as possible, the amount of oil required for a 16-foot roadway varies between 250 and 400 barrels of 42 gallons each to the mile. This depends upon the thickness of the oil crust made, the porosity of the material and the percentage of asphalt in the oil.

The quicker this oil crust is made the better. If two applications are made to a porous material and the oil properly stirred in each time, the crust will be finished. If the hard material is a clay, it should have at least two treatments. One will be sufficient for macadam. A dusty clay will require some gravel added for the first

heavy loads extremely difficult and driving disagreeable. The sandy substratum, as shown in the blocks, has become compacted under the firm oiled crust. Designating the roads by the order of the samples, No. 1 was surfaced with a clayey gravel, which always binds well. It was first treated in the summer of 1899, and subsequently in 1900 and 1901, but not at all in 1902. The amounts of oil applied were 120 barrels the first year, 80 barrels the second, and 40 barrels the third. The width treated was a little in excess of sixteen feet. The crust is a little over one inch thick. In No. 2 the oil was applied directly to the loose roadbed, without any expectation of benefit except to lay the dust. It was oiled the same years as No. 1, with 100 barrels, 120 barrels, and 80 barrels, respectively. It began to compact the second season, and since the third season has averaged about two inches thick. It is an excellent, firm road. No. 3 was formed during the season of 1902, with two oilings of 150 and 100 barrels,

sembles a city asphalt street when first laid.

CONCLUSION.

The question will naturally be asked, "Where can oiled roads be made to advantage outside of California and Texas?" The answer certainly must be, Any place in the United States where, through long, hot, dry summers the roads become very dusty and where water can be kept out of their foundations in the winter, so that they remain firm and do not give way beneath the oiled surface in the spring. The reliance must be upon an oil with an asphalt base, whether it comes from California or Texas or is made by dissolving an asphalt in the crude oil of any section, all of them being solvents for asphalt. The gilsonites of Utah and Colorado, the asphalt deposits of Indiana, Arkansas, Indian Territory, and probably other localities, will all doubtless yield a product that can be combined with the paraffine crude petroleums for road purposes. The cost will of course be much higher than in California, where they have been accustomed to buy their heavy oils for a dollar a barrel and sometimes cheaper, but compared with the cost of stone-covered roads it will be found to be less and in a very dry climate the results fully as good. Where the purpose is only to mitigate the dust any crude oil or its residuum will be found efficacious.

NOTE.—The writer requests that cordial thanks and appreciation for services rendered in the preparation of this paper be expressed to Messrs. A. S. Cooper, L. B. De Camp, John McLaren, and H. A. Mason, of San Francisco, Cal.; A. E. Burns, C. B. Boothe, O. W. Longden, and F. W. Mattern, of Los Angeles, Cal.; Theo. F. White, of Chino, Cal.; J. B. Glover, of Redlands, Cal.; N. V. Nelson and Hugh McGuire, of Marysville, Cal.; E. J. White, of Yuba City, Cal.; W. E. Coman, of Portland, Oreg.; James H. Nichol, of Camden, N. J.; D. W. B. Alexander, of Denver, Colo.; N. L. Taylor, of Tacoma, Wash.; and to many others whose names are not mentioned here, but whose kind assistance is very gratefully remembered.—ED.

Crude Petroleum Production in United States.

A highly interesting report on the production of petroleum in 1902 has been prepared for the Geological Survey by F. H. Oliphant, in which he notes the following points as the most conspicuous features in the production, sale, and export of crude petroleum and its products in that year.

The production of crude petroleum was greater than during any previous year; there was a slight decrease in the production of the Appalachian field, and a slight increase in the Lima-Indiana field; the general average price for crude petroleum was less than in any year since 1898; stocks held in the Appalachian and Lima-Indiana fields showed a considerable decrease, principally in the first mentioned; the exports of petroleum in 1902 were less than in 1901; no new pools were discovered in 1902.

The total production in the United States of crude petroleum in 1902 was

80,894,590 barrels, as against 69,389,194 barrels in 1901, an increase of 16.5 over that of 1901 and of 27 per cent. over that of 1900. The value of the crude petroleum produced in 1902 was \$69,610,384, or 86 cents per barrel, that for 1901 having been \$66,417,335, or 95.7 cents per barrel, a decrease of 9.7 cents per barrel, or 10 per cent., in 1902. The gross amount received for the total product in 1902 was only

\$3,193,013 greater than that in 1901, although the increase in output was about 16.5 per cent., greater.

The exports of petroleum and its products exceeded 1,000,000,000 gallons in 1902, for the second time in the history of the industry, the number of gallons exported being 1,064,233,601, a smaller total exportation by nearly 15,000,000 gallons than in 1901.

Novel Uses of Automobiles in Kansas.

Special Correspondence.

KANSAS CITY, Mo., Aug. 22.—The automobile was put to much valuable service during the recent flood period here. Of course the machines could not venture into deep water, but in messenger work and as transports they were almost invaluable.



TAKING WOMEN VOTERS TO POLLS.

able. While the two Kansas Cities were in the hands of the militia and small details of troops had to be moved rapidly from point to point, the automobile found a new field of usefulness. Horses were overworked in transporting drinking water and provisions.

On the motto of "let every man help however he can," which obtained during that time of emergencies, several motorists placed themselves and their machines at the disposal of the colonel commanding the city. E. P. Moriarty and Henry Merrill

A tonneau car, on a dry road about thirty feet away, was tied to the pole and pulled the horses out in safety.

It was by such demonstrations of practical work that motorists showed skeptical hilly Kansas City the utility of their machines. All the cars gave splendid service with only insignificant breakdowns.

It seems strange to see women voting. But they do—in the State of wheat and eccentricity—Kansas. Years of the same privilege that the men enjoy has made them as anxious as the men for the "perquisites" of elections. These consist principally in rides to and from the polls.

The accompanying pictures give an idea of the methods followed in the race for the mayoralty in Rosedale, a Kansas



WOMEN AT THE POLLS IN KANSAS.

suburb of Kansas City. The candidate on the "Progressive Citizens" ticket discarded horses, hiring instead three automobiles to bring his partisans to vote. Under the laws of the State each party chooses an emblem to be placed at the head of its ticket. The "Progressive" candidate took the automobile as his mark. The photographs show Rosedale's "City Hall."

The only sad part, from the automobile standpoint, is that the "Progressive" candidate lost by some fifteen votes. But he still sticks to the machine.

Not "Possessed of the Devil."

P. E. McKillip has a very fine electric automobile. The machine is possessed of a storage battery which can be charged with sufficient electricity to propel it for a distance of about seventy-five miles.—*Humphrey (Mont.) Democrat.*



ROSEDALE CANDIDATE FOR MAYOR.

were foremost among those who volunteered. Probably the automobile got more cheers for its work than had ever fallen to its share in this city.

Once a team, hauling goods from a flooded warehouse, was stalled in the mud.

A New Form of Friction Clutch.*

Stated briefly, the four conditions which seem to be involved in the problem of the friction clutch are:—

- (1) It must have sufficient gripping power.
- (2) Undue wearing of the surfaces must be avoided.
- (3) Provision must be made for conveying away the heat where there is much slipping contact in the clutch.
- (4) Motion should be imparted to the driven shaft without shock.

We are thus met at the outset with the contradictory conditions which have made the problem of the friction clutch such a difficult one. The author does not remember seeing in any previous writings on the subject, or in the statement of inventors themselves, the important fact mentioned in condition (3), but it certainly does account for the large number of instances in which friction clutches have failed to give satisfactory results for anything but the smallest powers.

Looking at the various clutches in use,

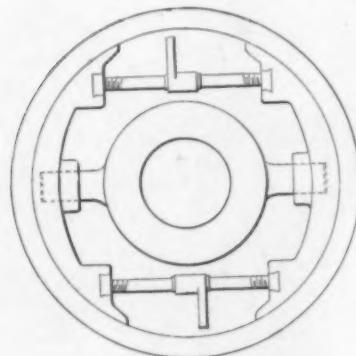


Fig. 3—Drum Expanding Clutch.

they may be classified and represented diagrammatically as follows:

- (1) The cone clutch (Fig. 1), where considerable pressure between the surfaces is obtained by the wedge action of the cone.
- (2) Various forms of rim clutch (Fig. 2), in which the action is obtained by means of levers.
- (3) Clutches with rings or segments expanding within a drum or annulus (Fig. 3).
- (4) The brush clutch (Fig. 4) in which brushes of wire are thrust into a finely serrated or grooved plate.
- (5) The coil clutch (Fig. 5), in which a coil of metal or wire rope with blocks is employed to give great gripping power.
- (6) The Weston clutch (Fig. 6), in which the friction effect is produced by a number of circular

*Condensed from a paper read by Prof. H. S. Hall-Shaw before the Institution of Mechanical Engineers, Leeds, England.

discs connected alternately with the driving and driven machine. There are numerous modifications in

designed for the purpose of allowing slipping to take place to any considerable extent, so as to prevent, at the same time, undue wearing and heating of the friction surfaces. These clutches, if not transmitting considerable power and not

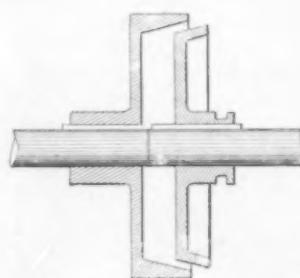


Fig. 1—Cone Clutch, Wedging Action.

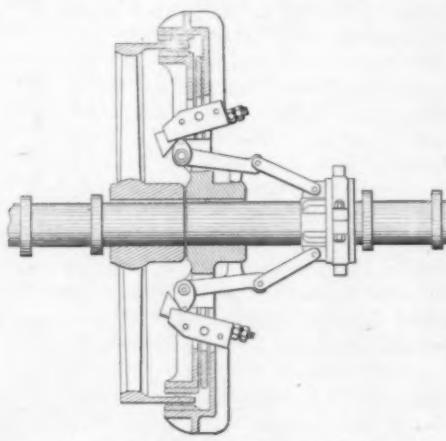


Fig. 2—Rim Clutch, Clamping Action.

detail of all these clutches, but the inventions in connection with them—which are very numerous—relate principally to the mode of obtaining the requisite pressure

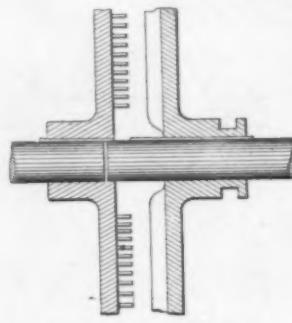


Fig. 4—Brush Clutch.

between the friction surfaces. Thus taking the case of the expanding ring or segment, which is one of the most successful forms,

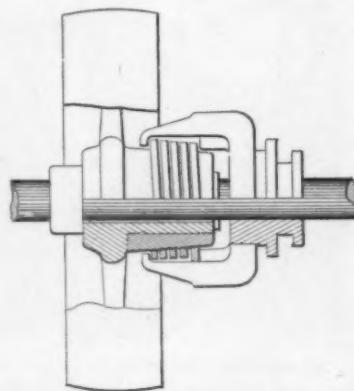


Fig. 5—Coil Clutch, Gripping Action.

wedges, right and left-handed screws and toggle joints, have all been used in different ways for expanding the rings or segments: but no clutches appear to have been

required to slip, serve their purpose very well. Some, such as the coil clutch, the Weston clutch, and the expanding ring clutch, may be made to transmit great powers, but it may be safely said that not one of the foregoing clutches has yet been designed so as to be capable of slipping for more than a very short time, without being seriously injured, even if the surfaces in contact were not actually destroyed.

There are plenty of illustrations in mechanical science where it has hitherto been impossible to reconcile conflicting conditions, such for instance as the variable change-speed gear, and it is an important question whether the present case forms another example or not. The author believes there is a way out of the difficulty, and this he proposes to bring forward.

Suppose a sheet of metal is pressed into a frustum, the section of the corrugation being the frustum of a cone, and that the disc is placed upon another one similarly corrugated. It will be observed that not only do portions of the frusta not make

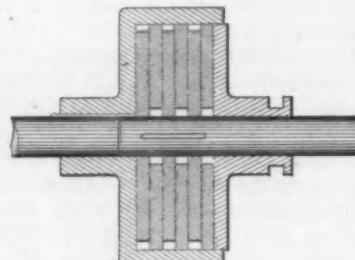


Fig. 6—Weston Clutch, Interposed Friction Plates.

contact with each other, but there is also a space left between the flat portions of the discs.

By placing these discs together as in



Fig. 7—Pair of Corrugated Friction Plates, Showing Clearance.

Fig. 7, and turning one alternately to the other, an amount of friction is produced which depends on the acuteness of the angle of the frusta. If a number of these plates are now placed in a box of the type of the Weston coupling, so that the plates alternately engage with two sleeves, one

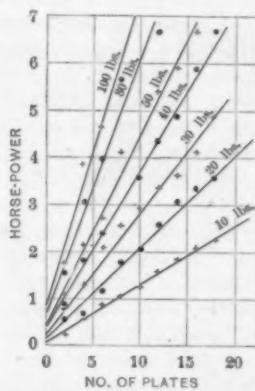


Fig. 9—Power Transmitted at Various Pressures.

connected with the driver and the other with the follower, as in Fig. 8, it will be found: first, there is very considerable gripping power; second, there is a tendency to part rapidly with heat, owing to the separation of the discs of metal.

The gripping power will be found much greater in a box of given length than with the Weston clutch, and yet this cannot be

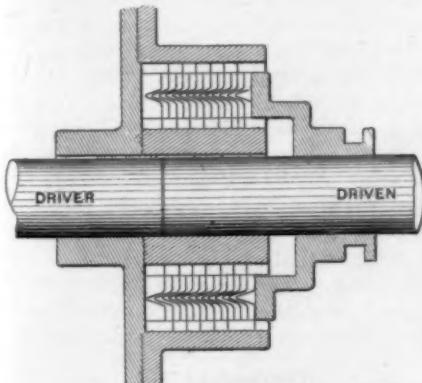


Fig. 8—Usual Arrangement of Corrugated Plates.

accounted for by the ordinary laws of friction, since the increased effect of the wedge action (which varies with the cosecant of the angle of the cone) is directly in proportion to the diminution in the number of plates which it is possible to put in a box, which diminution varies according to the same law. There is, however, a still more striking difference between the gripping action of the flat and corrugated plates when a lubricant is introduced.

Some explanation is, therefore, needed of this effect, and the conclusion has been arrived at that this is due—in part at any rate—to the necessary deviation from the

truly circular form of the corrugations in the plates.

Fig. 9 shows the results of a series of experiments with plates of 35° angle, represented so as to give the horsepower for any number of plates with varying pressures. Efficient lubrication of the surfaces in contact is insured by drilling the faces of the plates as shown in Fig. 10. This method is also indicated in the sectional view, Fig. 11. It will be noticed from this illustration that the number of plates in a given space depends upon the angle of the corrugation, thus: four plates with 30° occupy the same space as six plates with 50° . These four plates, however, give a better grip than the six plates with 50° , and have the great advantage of allowing a freer circulation of liquid, as may easily be seen from the figure. The plates are also much more rigid with the more acute angle.

Two views of a standard type of clutch for shafts up to two inches diameter are shown in Fig. 12.

pin causes the trigger to fly up and the clutch is hereby kept out of operation.

By moving the lever so as to force the ring *E* against the trigger, the pin end falls into the hole opposite it, and the coil spring is then allowed to transmit its pressure to the plates.

The same clutch may be enclosed, with

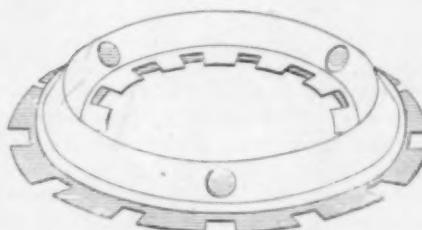


Fig. 10—Plate Showing Holes for Lubricant.

slight modifications, in a tight case and run in oil.

The writer has designed a reversing gear of this type for a steam turbine of 1,000-horsepower, the number of revolutions per minute being 700 to 800. The action of this type of reversing gear may be made as quick or slow as desired, but with a fairly heavy flywheel attached to the gear, it has been found possible to change from

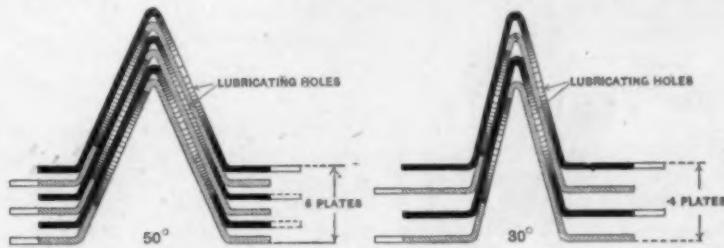


Fig. 11—Circulation of Liquid at Different Plate Angles.

The shaft is divided at *A*, the outside case *B* being keyed to the left-hand piece of shafting, and driving the set of plates having external driving teeth. The core *C* keyed to the right-hand shaft driving the plates as follows:—The sliding sleeve *D* containing a coil spring is fitted with pins which project through the outside case of the clutch; these pins press against a flat disc, which in turn presses against the plates causing the clutch to drive.

When the operating lever is worked so as to release the plates, the ring *E* encircling the sleeve withdraws the trigger pins from the holes into which they fit; the spring pressing on the opposite end of the trigger

full speed in one direction to full speed in the opposite direction in five seconds.

A satisfactory clutch is one of the most difficult things to secure for the motor car. The ordinary type of cone clutch, which is generally employed, the cone of which is covered with leather, can seldom be maintained in a normal condition for the following reasons:—A great command over the car, especially in driving through traffic, is secured by allowing the clutch to slip. When slipping has been going on for some time the surfaces are generally so altered in their condition that either the clutch will not grip at all or it grips violently and harshly. The result in driving is not only

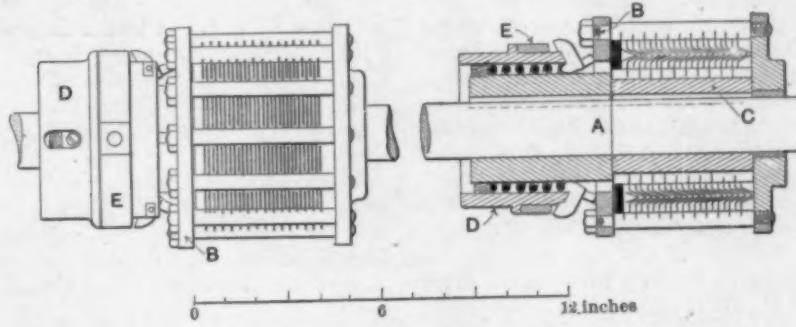


Fig. 12—Open Air-Cooled Clutch, with Triggers.

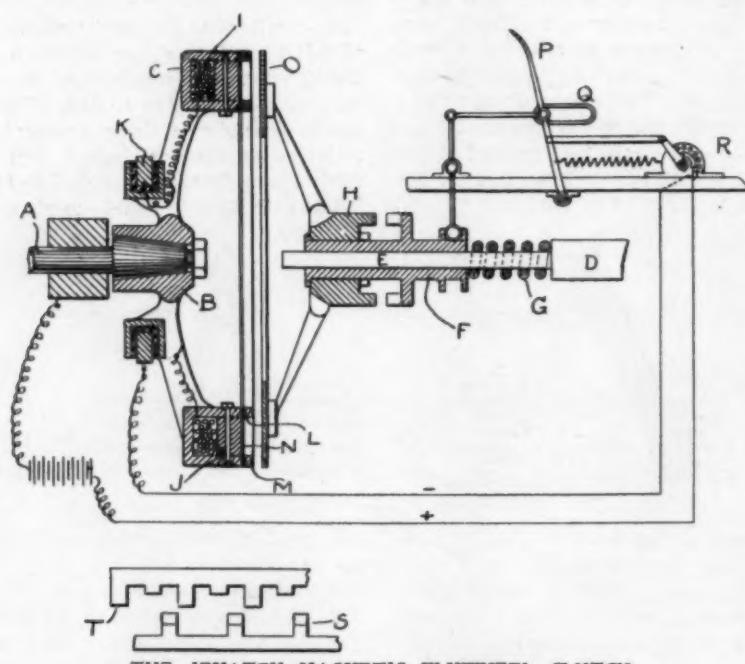
most unpleasant but it is very inimical to the car itself.

The author originally fitted one of his new clutches to a fairly heavy car, on which the engines had been changed from 6 to 12-horsepower. This clutch, although the plates were only six inches in diameter, drove the car so satisfactorily that the 6-horsepower gear has, under very trying conditions of the British Association tests on road resistance, been found quite strong enough for the purpose. Since then he has changed the cone clutch of a 24-horsepower Darracq car for one of the type described in this paper with remarkable improvement in its action. It has been found capable of driving the car so altered, although a fairly heavy one, for long distances, even in hilly country and without ever going off top speed, which is a direct gear to the driving wheels. The actual

Jenatzy Magnetic Clutch.

M. Camille Jenatzy, winner of the late Gordon Bennett race and previously well known as the designer of the "Jamais Contente" and other electric vehicles, is the inventor of a magnetic flywheel clutch which is successfully used on the Belgian "Pipe" cars, and which, according to report, will be fitted to the Mercedes and Mors cars next year. This clutch has lately been patented abroad and in this country, and from a comparison of the specifications the following particulars have been derived:

A is the motor shaft, B the flywheel hub, C the flywheel rim, and D the driven shaft. On the end E of D, which is squared, slides a sleeve F, backed by a spring G and carrying loosely on it the hub H of the driven member of the clutch. The rim C is made



THE JENATZY MAGNETIC FLYWHEEL CLUTCH.

speed at the normal revolutions of the engine on this car is seventy kilometers (*i.e.*, about forty-five miles) per hour. This example shows the possibilities of the clutch, with which the car can be driven for any required distance at the speed of three or four miles per hour, or even less, and after running for an hour or two under these conditions the clutch does not get hot. Of course the main object of the change gear, which is to increase the power if necessary, is not attained, since the slipping of the clutch can only involve loss of power, but this is a case in which, with an engine of sufficient power, variation in the range of speed is really a more important object rather than the saving in power.

An Up-to-Date Carpenter.

Martin Palmer's automobile is running fine. We dare to say that Martie is the only carpenter on earth who goes out to his work in an automobile.—*Poughkeepsie News-Press*.

an electro-magnet by recessing it, leaving an inner and an outer lip to form the poles, and embedding the coil I between them. A follower ring J of non-magnetic metal is then bolted in place. One terminal of the coils is grounded on the flywheel and the other led to an insulated feeding ring K, as shown.

The remaining construction of the rim portion is not wholly clear from the specifications, but apparently the two concentric rings L M are of soft iron, and are fixed by bronze screws to the rim lips, with the flat ring N interposed to prevent residual magnetism from causing the cast-iron armature O of the driven member to stick when the current is broken. Doubtless the reason for using this arrangement, instead of the more obvious and much common one of making one of the rubbing surfaces non-magnetic, is the desire to use the cheaper metal for the parts needing renewal.

In connection with the magnetic clutch

is a jaw clutch connecting H with sleeve F. This sleeve, which is shown in its rearmost position, is brought to that position by pressure on pedal P, a pin on which works in the slot Q. This pedal operates also a rheostat R, interposed in the clutch circuit, and which is open in the releasing position shown. As the pedals move backward, the rheostat arm closes the circuit through a resistance which is gradually cut out with further motion. On account of the slot Q this motion is not complete till after the jaw clutch has engaged F and H, and the grip of the rim clutch, with full power of the engine, is not absolute till the resistance is wholly cut out. Although the drawing does not show it, there is presumably a thrust collar or stop to limit the backward motion of H and ensure its disengagement from F.

The object of this jaw clutch release, which might not at first be apparent, is to relieve the gears of the shocks due to the inertia of the revolving armature O when changing speeds. In operation, the first pressure on the pedal will introduce resistance at R and allow the clutch to slip. When the pedal has moved the length of slot Q, it begins to draw sleeve F back, and final disconnection occurs just after the magnetic circuit is broken. On releasing the pedal after a shift of gears, F, which is now running at a different speed from H, engages the latter before the rim clutch is excited. It will be noticed that alternate teeth on H are longer than the others, while those on S are of uniform length and spaced to match the long teeth on H, as shown in the developed plan at the foot. According to the inventor, teeth S, on meeting the long teeth T, rub against their faces before engaging, thus softening the shock, and finally settle into engagement with the short teeth. At first sight this seems absurd, but what actually happens is probably that the teeth, having presumably rounded corners and being forced together only by the spring G instead of by hand, rebound more or less on their first impact, and receive some of the change of velocity in that way before they settle into final mesh. The object of the short teeth would then be simply to prevent "backlash" when the teeth are finally engaged.

The Quest for News.

Charles Taylor was over from Newman Tuesday in his automobile, or to be more exact, his Oldsmobile. He took the editor out for a spin over the boulevard—but we failed to run down any of the popus lace for a substantial article this week. We hope to have better luck next time.—*Tuscola (Ill.) Journal*.

Trying to Overcome Chicago Prejudice.

An automobile has made the run from San Francisco to Chicago in fifty days. The chauffeur must have started out with the intention of proving to the public that it is still possible to go slowly in a puff wagon.—*Chicago Record-Herald*.

The Geneva Steam Touring Car.

Some further particulars of the interesting steam tonneau car exhibited at the Cleveland show last winter by the Geneva Automobile and Manufacturing Company, and illustrated in these pages for the issue of February 2, have been furnished by the manufacturers.

This machine carries its boiler in front under the bonnet, and the engine is suspended horizontally just forward of the rear axle, one split case enclosing the cranks and the spur gear differential. The drive is direct by pinion and spur gear, and the cranks and gears are lubricated by splash. The wearing surfaces are large, and where possible are hardened and ground. The crossheads (the engine has twin double-acting cylinders) are of hardened steel running in bronze guides, and are very long. The forward end of the engine is flexibly suspended from the body, allowing the engine shaft to align with the axle under all conditions.

The reversing gear, instead of being of the Stephenson link type, is a modification of an old gear which has been used very successfully on traction engines. It is very simple and not liable to lose its accuracy by wear. As the sketch shows, it consists mainly of a spur pinion *A* of the same size as the driving pinion *B* of the engine and meshing with it, which is carried by a rocking cage *C*. Through a small crank pin and rod *D* this pinion drives the slide valve *E* exactly as an eccentric would. To reverse, the case is rocked about the crank-shaft through an angle of 50 degrees, which, for a given position of *B*, rotates pinion *A* through such a fraction of a turn, as shown by the dotted lines, as to advance

helical coils of 17-32 inch tubing, each coil about 2 1-2 inches in diameter. The coils are laid in horizontal tiers, spaced a little way apart to give the gases free passage, with the successive tiers criss-cross of each other. The coils are connected end to end, so that the water must travel the entire length of the combined coils. The water enters at the top, as in any

water passes through a filtering box packed with cotton waste, which separates the oil.

The running gear is practically the same as in the 1902 cars, but for the tonneau cars the size of the rear axle has been increased. It is now 1 1-2 inches in diameter, enclosed in 2 1-4 inch tubing of 14 gauge, and running on 1 1-2 inch American roller bearings. The axle is strengthened by 5-8 inch truss rods running from the spring seats under the differential gear case. The main frame



GENEVA STEAM CAR, WITH HORIZONTAL DIRECT-CONNECTED ENGINE.

flash boiler, and each coil is trapped at each end to prevent the water from flowing downward by gravity. In the present boiler there are four tiers of coils, making the boiler 12 inches high and 24 by 17 inches in plan. The gases are carried downward from the top of the boiler and discharged beneath the floor.

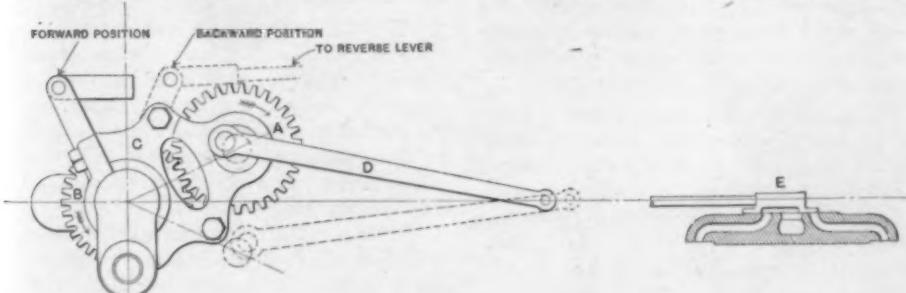
The burner is of tubular design with

is of angle steel, and the springs are semi-elliptic, 1 1-2 inches wide by 40 inches long. The wheels are artillery style, with 3 1-2 inch Dunlop tires. Wheel base is 86 inches, and tread standard. Fourteen gallons of gasoline and twenty of water are carried, and the weight, with tank filled, is given as 1,680 pounds.

German Association of Inventors.

The Central Association of Inventors "Germania," of Bayreuth, will hold a general exhibition at Nuremberg during September and October of this year for the purpose of facilitating the sale of patents and copyrighted patterns. There are more than 200,000 copyrighted patterns in Germany and over 140,000 patents; one-half of these, however, are not in public use, for the reason that the inventors were not able to exploit their inventions. On account of this, the Central Association was formed a few years ago. Its purpose is to assist the members to make their inventions profitable to themselves, as it is a well-known fact that a majority of inventors have not the means to do so. The association furnishes space to inventors without means free of cost and charges no fees for effecting a sale.

The plan of replacing horses in its delivery system with electric trucks has been practically abandoned by the Pabst Brewing Company, of Milwaukee, as the company has only a short haul down hill.



SIMPLE REVERSE SPUR-GEAR MECHANISM OF GENEVA CAR.

the valve to the reversing position. The reverse is operated by a pedal, and the throttle lever and the fire and water shut-off are on the steering column.

Steering is by rack and pinion, with tilting hand-wheel. The brakes are pedal-operated, and the brake-drums are cast solid with the rear wheel hubs. Expanding internal brake rings are used, and are double-acting. An emergency tire brake is applied by a hand lever.

The boiler, which is of the semi-flash type, differs somewhat from that described last February. It is made up of a series of

brazed and bolted joints, and is claimed to be very durable and to give a very hot fire. Gasoline is used for fuel, and the fire is controlled by a thermostat. An automatic regulator governed by the steam pressure opens a by-pass valve in the feed pipe when the pressure rises above a determined point, and closes it when the pressure falls. The exhaust steam is passed through a condenser at the front of the bonnet. This condenser is made up of horizontal flattened copper tubes, and is said to return about 75 or 80 per cent. of the water. After leaving the condenser the

The Charging and Care of Batteries.

A well-prepared and complete pamphlet on the care of the Exide automobile battery is issued by the Electric Storage Battery Company. It contains minute instructions regarding charging, general care, and ordinary repairs, with tables of voltages proper to batteries of different numbers of cells. Some paragraphs of general interest to battery users are quoted below.

"After a charge is started the current should be kept at the initial amount until the voltage reaches the 'finish' approximate figure, which is on the basis of 2.55 volts per cell, and it should then be immediately reduced to the 'finish current' rate, and continued at this rate until the voltage stops rising, the readings being taken at one-half hour intervals. For example, if the battery to be charged consists of 24 cells, type 9 PV, the charge should be started at 20 amperes, and the rate kept at this figure until the voltmeter indicates 61 volts; when this voltage is reached the rate should be reduced to and maintained at 8 amperes until the voltage, which fell after the rate was reduced, stops rising, or, in other words, reaches a maximum. The figure at which it stops rising will be variable, although in general it will be approximately the same as the voltage (61 volts) at which the high rate of charge must be reduced.

"If, in case of emergency, it is desired to charge the battery more quickly than usual, or, in other words, to hurry the charge, the early part of the charge is the time when the extra high current should be used, the completion of the charge being accomplished at the low final rate, the same as in normal charging. Much injury can be done by 'pounding' a nearly full battery at a high rate.

"If, after a late evening run, the vehicle will be wanted early the next morning, the battery may be charged during the night without an attendant being present; but in doing this great care must be taken not to excessively overcharge. As, under this condition, the charging rate will not be kept constant, an estimate of the amount of current taken out during the discharge should be made and the amount of charge to be given based on this estimate. If, say, 72 ampere hours is required to recharge, and the time available is nine hours, the average rate of charge must be 8 amperes. If the charging is done from a 110-volt circuit, the rate at the start should be about 12 amperes; if from a 500-volt circuit, about 10 amperes; as, in charging from a source with constant voltage, such as a lighting or trolley circuit, the rate into the battery will fall as the charge progresses.

"Excessive and injurious overcharging may take place in two ways—by charging too long and by charging too frequently, or every time a vehicle has been run a short distance; for instance, if, with a bat-

tery that will run a vehicle forty miles, the vehicle is run five miles, then charged, taken out again, run ten miles and is charged, then is given another run of ten miles and is charged and again a third run of ten miles is made, followed by a charge. The vehicle has been run only thirty-five miles, but the battery has been charged four times. The greatest wear on the plates of a battery occurs during the final part of a charge. In treating the battery as above, it was charged three times more than necessary, and even then did not make the mileage it should have made on one charge. In other words, where a vehicle is in daily use for short runs, do not charge until over 50 per cent. of the capacity has been exhausted. By following this course, not only is money saved on the current bill and the life of the plates increased, but the battery will give a greater mileage.

"A battery standing unused for some little time will lose a part of its charge, due to local losses in the cells. This can seldom satisfactorily be entirely regained by merely giving a freshening charge. If full capacity is desired, the battery should first be given a complete discharge and this followed by a full charge.

"If a battery stands idle for days at a time, it should be given a freshening charge once a week.

"Experience has shown that the best results, both while charging and discharging, can be obtained when the battery temperature is between 70° and 90° Fahrenheit. A considerably lower temperature will materially reduce the available capacity; this reduction, however, being regained with a return to normal temperature, should not give rise to a feeling that the battery is failing, as low temperatures do not injure a battery; on the contrary, however, if the temperature for any considerable time is above normal, the wear on the plates is excessive."

"The apparent falling off in the capacity of a battery can always be traced to some cause, and when a battery gives indications that something is wrong, take it out of the vehicle and look for the trouble. There may be a dry cell, due to a leaking jar; sulphated plates, due to the battery having been run too low and not properly charged; the cells may need cleaning (and this trouble is always indicated by short capacity on discharge and heating very quickly on charge), and when a cell is cut apart the deposit or sediment in the bottom of the jar is found to be up to the plates, short-circuiting them, or some of the cells may be short-circuited, due to broken separators.

"If the trouble cannot be located by the eye, connect the battery in series, and then discharge it at the normal vehicle rate by running the positive and negative wires either to rheostats or a receptacle filled with very weak acid or salty water. To the end of each wire attach a lead or iron

plate, and by suspending them from sticks across the top of the vessel the flow of current can be regulated by moving them closer or farther apart. If all cells can be reached, the battery need not be removed from the vehicle, but can be discharged by using the charging plug connected to resistance as set forth above.

"As the discharge progresses, the voltage, as indicated by the voltmeter connected to the terminals of the battery, should be frequently read, and as soon as it shows a noticeable drop the voltage of each cell should be read with a low-reading voltmeter, and such cells as read 1.70 volts or less marked. These individual cell readings to be continued until all cells reading lower than the average are located. While the readings are being taken the discharge rate should be kept constant and continued until the majority of the cells read 1.80 volts. This discharge should be followed by a charge until the cells which read 1.80 volts are up, when the low cells should be cut out and examined for the cause of their lowness.

"If the acid is low in gravity and the plates have a whitish appearance, and there is no mud or deposit in the bottom of the cell, the plates are sulphated. They should be put back in the same solution and given a long, slow charge at quarter the normal vehicle rate. This will cause the gravity of the electrolyte to rise and the cell to come back to its full capacity. Continue this charge for 48 hours, or until the gravity of the electrolyte stops rising and the voltage is about 2.55 volts per cell. Then discharge at the normal rate, and if full capacity is not reached, give another low-rate charge. If the temperature of the cells gets too high (100° F.), reduce the charging rate or stop charging for a time until the temperature falls.

"As a rule, more than one cell will be found in this condition, and all of the weak ones should be grouped by themselves and charged in series as a separate battery. If there is not enough resistance in the charging rheostat to cut the current down to the proper point, use water resistance referred to above in series with it.

"While a cell is being treated, the cover should be removed (the sealing compound can be loosened by using a hot putty knife) and not replaced until the cell is again ready for service."

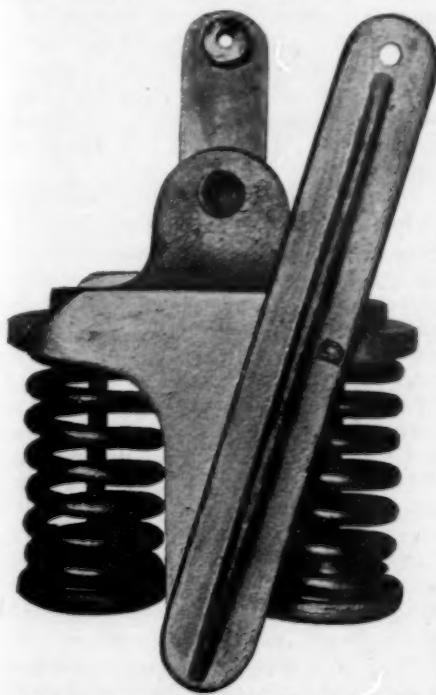
Storage Station Company Incorporates.

The Willard Automobile Station has been incorporated at Washington, D. C., by Louis P. Hall, Albert L. Kull, and Edward F. Colladay, to conduct a general automobile business at 400 Fourteenth Street, N. W. The capital stock is \$25,000. The officers are Charles Jacobsen, president; Louis P. Hall, vice-president; A. L. Kull, secretary and treasurer. The officers, together with Eugene Cochran and Henry Hammond, will constitute the board of directors for the first year.

Supplementary Side Spring Arrangement.

It has long been held in some quarters that it is impossible, with the ordinary arrangements of springs used in automobiles, to combine strength and steadiness to withstand severe shocks and heavy loads, with a satisfactory degree of elasticity for normal roads and light roads. Most builders avoid meeting this problem directly by using springs adapted to average conditions and adding buffers to receive shocks; but this is at best a makeshift serving rather to protect the axles than to add to the passengers' comfort.

The device shown in the accompanying engravings is intended to overcome this



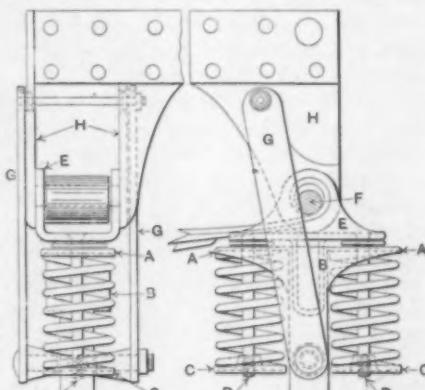
GRAHAM SUPPLEMENTARY SIDE SPRING.

difficulty by the use of a light supplementary pair of springs, interposed in place of the shackles between the ordinary semi-elliptic side springs and their brackets, and designed to absorb the small vibrations of the road, under which the main springs bend but slightly. When a shock exceeds the capacity of the light spring, its coils simply close up solid, and the balance of the shock is absorbed by the main spring. As the drawing shows, the springs bear at AA against a casting B, and at CC against threaded washers screwed on bolts DD, passing loosely through holes in B and having heads carried by an eared casting E. A pin F connects the spring ends with E. The weight of the vehicle is transmitted to B by links G, and the springs are compressed between A and C.

The line cuts show side and end views of the device applied to a Winton touring car. It will be noted that the body is raised by an amount equal to the length of the shackles, whose lower ends were

originally pivoted on a bolt passing through the ears H at approximately the position now occupied by F.

As this device is intended to absorb the light shocks and remove the necessity for



END AND SIDE VIEWS OF SPRING.

buffers, it is to be supposed that the main springs are strengthened by an extra leaf. The Graham Company, Boston, Mass., is the maker.

The Lohner-Porsche System.

The Lohner-Porsche combination gasoline-electric vehicles are equipped this year with 4-cylinder Panhard motors, mounted under a forward bonnet in the usual way. On the rear end of the engine shaft is keyed the armature of the dynamo, no flywheel being required. No auxiliary storage batteries are employed, except a small group of six cells used for ignition, for the lamps, and for starting the engine by using the dynamo temporarily as a motor. The dynamo current is delivered directly to the peculiar hub motors in the front wheels, which have become identified with the Lohner-Porsche construction; and these wheels, which are therefore both drivers

over a sector with six notches. This lever combines in itself all the control functions except the above two, even the pedals being discarded. In its first or foremost position it gives the reverse; in the second, the engine is started; the third position serves for all ordinary road work, including grades up to 12 per cent. Speed is regulated by the throttle and spark; and as there is no fixed relation between the engine speed and that of the vehicle, the engine may be running fast and generating full power while the motors are pulling the vehicle slowly up a grade with an overload of current. The fourth position is for grades exceeding 12 per cent., presumably by virtue of a change of gear, though *La France Automobile*, from which these particulars are taken, is not clear on this point. The last two positions operate respectively an electric braking system in the hubs and the electric brakes plus mechanical brakes on the rear wheels as well.

The weight of these vehicles is stated as 1,800 pounds for the 15 to 18-horsepower cars. They are built in sizes up to 70-horsepower.

Dangerous Hurdling in Milwaukee.

Special Correspondence.

MILWAUKEE, Aug. 29.—Theodore Jonas, a local automobile agent, and George F. Battey, of Philadelphia, narrowly escaped death or serious injury recently as the result of a peculiar accident.

While riding about the city in a heavy French touring car they made an attempt to cross the Grand Avenue pascule bridge after the signal of warning had been given preceding the opening of the bridge. The car ran rapidly up one lift and struck heavily against the other section, which had risen a foot or two higher. Mr. Jonas was thrown out of the car and sent flying across the widening gap between the two sections of the bridge. He landed on the



LOHNER-PORSCHE COMBINATION CAR.

and steerers, are fitted with short ribbed cast-metal spokes connecting the periphery of the motor casing with the rims.

On the steering wheel are two handles controlling the throttle and the spark advance of the engine. At the right side of the vehicle there is a single lever, working

opposite lift uninjured and made a hasty escape from his perilous position. The section that the car was on was stopped by the bridge tender, who had seen the accident, and the machine was backed down running smoothly to the pavement. It was not damaged.

Correspondence

Through Nebraska Mud in a Runabout.

Editor THE AUTOMOBILE:

Sir: Nebraska may be a nice place for automobiles in a dry time, but of all places in such weather as last week "excuse me."

We left Denver August 9 and made 243 miles in a day and a half; then the "floods



DAMP SPOT NEAR MINDEN, NEB.

came and the rains descended." We would wait a day or two in a town; then, after we had got acquainted with all the inhabitants, would make a little run in the mud to another town for a visit of a day or two.

The country was all but impassable: flooded in all low places, and as the country is all low in central Nebraska you

The last part of the week was better and we arrived in Omaha on Saturday, August 22. We shall leave here in a day or two if the roads are in condition, but as I write a shower is in progress here and Noah never saw the equal.

We have dug some of the mud off ourselves and the machine and find we are all here and in good condition. One of our front tires that had never been pumped since leaving San Francisco burst 125 miles from here and we ran into Omaha with it flat, as we had no extra tire. The other three tires are still in good condition, though showing some wear from the 2,000 miles of rough usage.

I enclose a print of our "mud" experiences, as they are dear to our hearts and fresh in our minds.

L. L. WHITMAN.

Omaha, Aug. 24.

Molasses-Glue Compound Ferments.

Editor THE AUTOMOBILE:

Sir:—On page 118 of THE AUTOMOBILE of August 1, 1903, there is an inquiry published in regard to a compound for single tube tires. Several formulas were given in the answer, but no mention was made of the fact that a compound, sold for this very purpose, was advertised in same issue.

We would state, as a matter of information, that the mixture of glue and molasses will ferment; this chemical action causes it to become acid, and it is, therefore, positively harmful to rubber. If such a mixture as you propose could be used without injury to tires, we would not go to the

TWO RACING LAUNCHES CONTEST SUPREMACY IN NEW YORK BAY.

The many thousands of persons who have passed up and down New York Bay during the past two weeks on their way to and from the course of the America Cup races have been interested in the work of two very fast launches which have been under way with the fleet. Both of them are new to New York, though one was built last year and has already been described in THE AUTOMOBILE. This craft, the *Adios*, was designed by H. J. Leighton, of Syracuse, who also designed and built her engines, and was built by T. M. Milton, of Brewerton, New York, a small town in the vicinity of Syracuse. Her dimensions are as follows: length over all, 55 feet; length on waterline, 55 feet; breadth, extreme, 7 feet 9 inches; breadth on waterline, 6 feet 6 inches; She is fitted with a single screw driven by eight cylinders, each of 15-horsepower, making 120-horsepower in all. The motor is of the two-cycle type.

She is in model an open launch with plumb stem and "torpedo" stern, with one large open well, and though built for speed the construction is strong and the interior of the cockpit is handsomely paneled with mahogany, the coamings, lockers, etc., being of the same wood. She carries a canopy top which is removed for racing.

Last year the *Adios* was speeded over an accurately measured course of two miles on Onondaga Lake, at Syracuse, making twenty-three miles. She had been run very little this year until fitted out last month and brought to New York.

The second launch, *Standard*, was designed and built by the Marine Construction & Drydock Co. of Mariner's Harbor, Staten Island, for E. A. Riotti, of the United States Long Distance Automobile Co., of Jersey City, also builder of the Standard gasoline marine motor. The launch was designed to carry a new pattern of Standard motor, of 100-horsepower, just built. The hull is of mahogany, very lightly built, and is 58 feet 10 inches over all, 6 feet breadth at waterline, and 12 inches draft. It is decked, with three small cockpits for helmsman, engineer and passengers. The motor has six cylinders and runs at about 400 revolutions; like all the Standard motors, it is of the four-cycle type. The wheel is of 41 inches diameter.

The *Standard* made her appearance in New York waters, fresh from her builders' yard, early last month, running very fast and exciting considerable curiosity among yachtsmen and the passengers on ferry-boats and Sound steamers. At first nothing was known about her and the most absurd stories were printed, her speed being given as forty-five miles.

The two boats were entered in the power boat regatta of the Brooklyn Yacht Club set for August 29, but the heavy gale of that day caused the regatta to be post-



ASCENDING TO BRIDGE OVER WASHED-OUT APPROACH.

can see that steamboats could do a better business than automobiles. One rain of ten and one-half inches, showers of four inches, and six of them in five days, when the country was already soaked with three weeks' of previous rains, is all that it is necessary to say to those who know the country.

We had to make a long detour to find a bridge that was passable over the Platte River, and this was gone at the approaches. By using two long planks we ran these successfully.

trouble and expense of manufacturing the preparation above referred to. The latter contains neither oil nor acid.

GEO. P. MOORE CO.
San Francisco, Cal.

A Personal Affair.

Ald. Dederich of the council committee on ordinances has declared against automobiles, and will favor limiting them to a slow rate of speed. He came near being run down by one yesterday.—*Detroit News*.

poned for a week. As these launches were present, a special match ratch race was arranged, the course being from off the Brooklyn Yacht Club, in Gravesend Bay, around the Robbins Reef Buoy and return, 10 1-2 nautical miles. This course led through Gravesend Bay, up the Narrows and well into the Upper Bay and back.

Under the rule of the American Power Boat Association, the *Adios* measures 76.21 rating, while the *Standard* measures 84.21; the smaller boat being allowed 3 minutes 27 seconds for the course.

The start was made at 3.35 P. M. in half a gale of wind and a heavy sea. The *Standard* was the first to get her full speed, but after a short distance she had to stop on account of the heating of a pump, losing about five minutes before she was again under way. This proved a fatal handicap and the *Adios* won easily, her elapsed time being 34 minutes 17 seconds and her corrected time 30 minutes 50 seconds, as compared with 42 minutes 20 seconds for the *Standard*.

ROAD RIGHTS OF MOTORISTS UPHELD IN INDIANA.

Special Correspondence.

INDIANAPOLIS, Aug. 29.—The automobile has won its first victory in the courts of Indiana. The county judge at Sullivan County was yesterday called upon to decide just what rights the automobilist has, on the public highways of that county, thereby setting a legal precedent for the rest of the Hoosier State.

The case was a suit for damages brought by Homer Trimble against Dr. George Pirtle, at the passing of whose automobile Trimble's horse became frightened and smashed the buggy to which it was hitched.

The rights of all automobilists in the State were involved, for the litigation raised the question whether the horse, having antedated the automobile by several centuries, had any greater rights on the county roads than his horseless rival. Trimble's attorney contended that this was the case but the judge decided differently. The court's ruling was that the automobile had as much right on the roadway as the horse and that it was Trimble's own concern if his steed did not behave as it should. The suit was dismissed at the expense of the plaintiff.

Mrs. W. H. Kirkpatrick, wife of the sales manager of the Peerless Motor Car Co., was the victim of a peculiar automobile accident on August 22. A party including Mr. and Mrs. Kirkpatrick, Mr. Kirkpatrick's mother and J. B. Kavanaugh, was ascending Long Hill, which leads up to the Pine Crest Hotel at Little Mountain, twenty-five miles east of Cleveland, in an automobile, when the machine overturned in some manner. None of the party at first appeared to be injured, but Mrs. Kirkpatrick, who had been in ill health for some time, fainted and died before medical assistance could be secured.

SPEED RIVALRY ON HOME RUN FROM DEL MONTE TOURNAMENT.

Special Correspondence.

SAN FRANCISCO, Aug. 19.—On Sunday, August 9, the day preceding the automobile races at Del Monte, Cuyler Lee and O. D. McNabb, of San Francisco, started at 8.35 A. M. from the main entrance to the Hotel Del Monte in a Cadillac to make the best time through to Oakland, a distance of 131 miles. The roads in many places were very rough and the steep San Juan grade, which is four miles from level to level, had to be surmounted. The *Examiner* office in Oakland was reached at 2.40 P. M., in the elapsed time of 6 hours 5 minutes. Mr. Lee was so pleased with the performance that he made a bet of \$200

from the Hotel Del Monte at 8.35 A. M., in a Peerless car, arriving in San José at 12.45 P. M., in the elapsed time of 4 hours 10 minutes. This time was made in spite of meeting with a band of horses and a herd of cows, and twice being compelled to go into the ditch to let hay wagons pass. In one case the motor car had to be jacked up and boards placed under the wheels to extricate it from the deep sand. The second time the car was ditched a spark plug was broken, and this caused considerable delay. Oakland was reached at 2.25 P. M., the elapsed time for the whole journey of 131 miles being 5 hours 50 minutes. The time of Cuyler Lee, in the Cadillac, was thus beaten by fifteen minutes. If the two hours lost by Keenan and Luckhardt in the San José jail are deducted, the Toledo



TROPHIES PRESENTED AT DEL MONTE, CAL., TOURNAMENT, AUGUST 10 AND 11.

that the record would not be beaten by any of the motor cars returning from Del Monte.

On Wednesday, August 12, three attempts were made to beat the record. James A. Keenan and Caesar Luckhardt started from the same place at the same hour in the morning, the word for the start being given by F. A. Hyde, President of the Automobile Club of California. Keenan and Luckhardt were in a two-cylinder Toledo car. They reached San José, eighty miles from Del Monte, at 12.10 P. M., in the elapsed time of 3 hours 35 minutes. There they were arrested by the sheriff, assisted by a number of deputies, for exceeding the speed limits in various towns though which they had passed. It was two hours before they were released upon the deposit by Clarence Letcher, of San José, of \$100 bail.

R. C. Lennie and L. T. Andrews started

covered the distance in 5 hours 35 minutes.

At 11.21 A. M. on the same day C. A. Hawkins, Arthur Inkersley and H. D. Ryus started from Del Monte hotel in a White touring car, fitted with tonneau. Salinas was reached at 12.16, in 55 minutes. At Watsonville, and again at San José the operator took the wrong road, occasioning considerable loss of time. There was delay also at San José in getting gasoline and a mile from there in repairing a punctured tire. Despite these losses of time, the party reached Oakland at 5.54 P. M., their elapsed time being 6 hours 33 minutes. The roads were rough and full of chuck holes, and one of the steepest hills in California—San Juan grade—had to be ascended. The descent required twice as long as the ascent. The average speed for the whole elapsed time was more than twenty miles an hour.

British 1,000-Mile Motor-cycle Trials.

Special Correspondence.

LONDON, Aug. 20.—The 1,000-mile reliability trials for motor cycles, organized by the Auto-Cycle Club, of London, were started at the Crystal Palace just after 8 o'clock on the morning of Tuesday, August 11. The trials have been so arranged as to bring the contestants back to the starting point at the end of each day's journey, each day averaging a run of more than 100 miles, and to extend over a period of two weeks, a series of speed contests terminating the tournament on Saturday, August 22.

On Monday, August 10, forty-five motor cycles of all types and sizes were grouped in a tent on the Crystal Palace grounds, where the weighing-in and other preliminaries took place. The start was made on the following morning under threatening skies which soon fulfilled their promise of rain, which fell incessantly, not only on that day, but practically throughout the week. Saturday and Sunday, August 15 and 16, were spent in idleness, the men much appreciating the opportunity to rest themselves, the severity of the weather having tested the endurance of the plucky contestants no less than the ability of their machines to withstand all sorts of atmospheric and road conditions.

The rules require that not even the slightest repair can be made during the two weeks of the trials without the loss of marks, and at the same time it is required that the machines shall not be cleaned without suffering a similar penalty, a certain number of marks resulting in disqualification. In addition to testing the reliability of motor cycles as it has never before been tested, this series of trials includes speed contests, hill-climbing trials, and tests of skill in handling and economy of operation.

THE FIRST WEEK'S PROGRAM.

The first week's program included the following daily runs:

Tuesday, August 11, Canterbury and back, *via* Maidstone, distance 118 miles; Wednesday, Brighton and back, *via* Lewes and Uckfield, with Westerham hill on the return, distance 107 miles; Thursday Worthing and back, 108 1-2 miles. Friday's run, the longest of the daily trips, was to Eastbourne and back, *via* Hailsham, Tonbridge and Riverhead, distance 125 miles.

The machines were not started on Saturday or Sunday. On Monday, August 17, when the trials were resumed, the destination was Folkestone. Brighton was visited for the second time on Tuesday, and Basingstoke terminated yesterday's journey.

During the trials, and up to the present writing, the machines have given a good account of themselves, although a number of the original forty-three starters have fallen by the wayside.

WESTERHAM HILL-CLIMBING TEST.

The first important event of the run was the Westerham Hill climb, which took place on Wednesday last. The Westerham hill is practically a mile long, and the grade is about 14 per cent. in the steepest part. The road surface was in miserable condition, as is already shown by the results, which are very creditable, everything considered, although at first glance this fact does not appear.

In spite of the inclement weather and the unsatisfactory condition of the road, thirty-five competitors started at the foot of Westerham Hill on the afternoon of August 12, although only seven of this number reached the top without dismounting. The best performance was that of F. W. Applebee, on his 3-horsepower Rex, whose average speed up the grade was at the rate of fourteen miles an hour. A. Wright, a 3-4 horsepower Ormonde, was second, at the rate of thirteen miles. Many of the operators were forced to stop on the steepest part of the hill on account of overheated motors. After the motors had cooled off they reached the summit of the hill without further trouble.

The successful contestants in the Westerham Hill climb, with their official average speeds over the measured distance include the following:

OPERATOR.	MACHINE.	AVERAGE SPEED.	Miles Per Hour.
Applebee	3-h.p. Rex.....	14	
Wright,	2½-h.p. Ormonde ..	13	
Mills,	2½-h.p. Phoenix ...	12	
Simms,	2½-h.p. Alldays....	11½	
Hooydonk,	3-h.p. Ariel.....	11½	
Hayes,	2½-h.p. Kerry.....	8	
Coles,	2½-h.p. Brown.....	6	

ENGLISH 1,000-MILE RELIABILITY TRIALS SEPTEMBER 18 to 26.

The fifth annual reliability trials of the Automobile Club of Great Britain and Ireland are to be held this year at London during the eight days beginning September 18. The Crystal Palace is to be the headquarters, from which the start will be made each day and to which the competitors will return each night. The system of marking is to be more severe than ever before, each car having debited against it marks for every stop on the road, every repair, adjustment and renewal made during the whole period of eight days, whether made on the road or in the official control before or after the day's run.

The course is in a different direction each day, the average distance being more than 127 miles, aggregating in all 1,019 miles. No account is to be taken of speed, other than to penalize any excess over the legal limits, except in the four hill-climbing

contests and the track events at Bexhill. An official observer will accompany each vehicle.

The system of marking is much more extensive than in the forthcoming trials of the National Association of Automobile Manufacturers in this country, as every important quality is taken into account, including condition at the finish, efficiency of the brakes, absence of noise, vibration, smoke or vapor, amount of dust raised and ability to start on hills.

The courses selected for the daily runs include widely different conditions of roads and gradients.

A very novel feature is the plan to make photographic records of the quantity of dust raised by each car during the brake tests and to award credit marks in proportion.

The program for the week's trials is as follows:

Tuesday, September 15—Assembling of all the competing cars in the Crystal Palace by noon.

Wednesday and Thursday, September 16 and 17—Tests for brake efficiency, freedom from noise and raising of dust in Crystal Palace; examination of cars by the judges.

Friday, September 18—Run to Margate and return.

Saturday, September 19—Run to Eastbourne and back; Bury hill-climbing contest.

Monday, September 21—Run to Worthing and return; Bury hill climb.

Tuesday, September 22—Run to Folkestone and back.

Wednesday, September 23—Run to Southsea and back. Hindhead hill climb.

Thursday, September 24—Run to Bexhill and back; speed trials on Bexhill track.

Friday, September 25—Run to Winchester and back.

Saturday, September 26—Run to Brighton and back; Handcross hill climb.

Monday and Tuesday, September 28 and 29—Examination of cars by judges for final awarding of marks.

ENGLAND AND GERMANY PREPARING FOR GORDON BENNETT RACE.

Almost before the automobile world has given up the discussion of this year's Gordon Bennett cup race, preliminaries regarding the contest for 1904 are being arranged.

The Automobile Club of Great Britain and Ireland has recently announced the rules governing the selection of vehicles which will represent England in the International race next year, and it is evident from their severity that every effort is to be made to recover the coveted Gordon Bennett trophy from Germany for which country it was won by the victorious Jenatzy on the Irish course on July 2, last.

According to the requirements governing intending competitors laid down by the English club, the last date on which

entries will be accepted is December 31, 1902. Each prospective contestant must accompany his initial entry with a fee of \$250 and each additional entry with a fee of \$125. The money thus collected will be applied toward defraying the expenses of the eliminating trials which will be held late in April.

As a guarantee of good faith, and in order to prevent irresponsible parties from achieving notoriety by announcing that they will enter one or more cars for the great race, the automobile club requires that each contestant company must deposit with the club a sum of \$1,250 in addition to the original entry fee, a single deposit of this amount covering any number of cars entered by an individual manufacturer or concern. If the cars vouchered for by the \$1,250 guaranty are not on hand at the appointed place at noon on April 16 next, on which day the preliminary inspection will take place, or if they do not, in the opinion of the inspecting committee, conform with the requirements of the Gordon Bennett rules, the deposit will be forfeited. If, on the other hand, the cars are properly entered and ready for the inspection committee on the date stated and are found to fulfil the requirements, the deposit of \$1,250 will be returned.

After the eliminating trials, during which the action of the competing cars will be carefully studied by a technical committee, selected by the club, three cars will be finally chosen and their drivers nominated to represent Great Britain in the race. Several reserve cars and alternate drivers will also be nominated at the trials. The A. C. of G. B. and I. announces that the winners of these trials will not necessarily be selected to represent the club in the race, as every contingency will be taken into consideration, speed being only one of the qualities required of the successful contestants.

Cars intended for competition are not to take part in any previous competition without permission first having been secured from the automobile club.

INTEREST IN GERMANY.

It is reported that leading German automobile clubs have appropriated the sum of \$20,000 which will be devoted to defraying preliminary expenses attending the next Gordon Bennett race, and it is anticipated that the same care to avoid accidents that characterized the arrangements of this year's race over the Irish course will be observed.

The proposed route is from Homburg to Ober-Ursel, along the road locally known as the Kanonenstrasse, and via Schmitten to Braufels, and then to Giessen and Saalburg, a total distance of 99 1-2 miles. This course is almost ideal, although there are a number of sharp turns and steep grades; it extends through a pine forest for the better part of the distance, and across a meadow where there will be little necessity for village neutralization.

almost no danger from cross-road traffic.

Although this course has not been finally decided upon, there is every probability that it will be the one selected. Herr von Brandenstein, secretary-general of the German Automobile Club, has already gone over the route, accompanied by Herr von Mary, the burgomaster of Homburg, and other officials of that district, and it is understood that they will strongly recommend this course as the most desirable.

Trotting Horse Paced by Automobile.

The value of the automobile as a pacing machine for race horses has now been demonstrated. Last week George Ketcham, of Toledo, O., purchased a large steam touring car, which he announced would be used to pace his famous trotter Cresceus, in an attempt to break his well-remembered record. The first trial was made at Dayton, O., on Thursday, August 21. It was arranged that Cresceus should travel

SAD DEATH OF MRS. WINTON AT NEW CLEVELAND HOME.

Special Correspondence.

CLEVELAND, Aug. 28.—Every one interested in automobiling and a host of the friends and acquaintances of Alexander Winton, were shocked last Friday to learn of the violent death of Mrs. Winton. Early Friday morning Mrs. Winton's body was found floating in Lake Erie, a short distance from the Winton home, which is located on the lake shore. There is a bank seventy-five feet high on this portion of the shore and Mrs. Winton either threw herself, or accidentally fell, into the lake from this bank. Just how the death occurred will probably never be known.

Mrs. Winton had been in ill health for some months. Her recent trip to Europe when her husband competed in the Gordon Bennett race was taken with the hope that her health would be benefited. Recently her condition had been such that a trained



TROTTER CRESCUS BREAKING RECORD PACED BY AN AUTOMOBILE.
Cresceus on Extreme Right, Mike the Tramp in the Centre.

beside his running mate, Mike the Tramp, the automobile following on the outside and a little behind. Mike the Tramp, however, soon dropped behind and the driver of the automobile, realizing the situation, jumped his machine into the vacant place beside Cresceus, keeping the front of the car close to the wheels of the flying sulky. The noble horse was not to be defeated by this strange steed and he came down the stretch like a flash, the car, with throttle wide open, finishing even with him in a final burst of speed. The time for the mile was 2:08 3-4, a world's record for a half-mile track.

The automobile used in this novel and successful experiment was a standard White touring car, driven by E. C. Denzer.

Charley—"Oh, dear, I'm so tired! I'm all out of breath."

Frank—"Sort of pneumatic tired, eh?"—*Exchange.*

nurse was kept in constant attendance.

The general supposition is that Mrs. Winton was temporarily deranged. She was an ideal helpmate throughout Mr. Winton's long struggle in perfecting his inventions and the building up of his business. It is very sad that death should have come just at a time when they were in a position to enjoy the fruits of success. Mr. Winton had only recently completed a beautiful home overlooking Lake Erie. It was owing to the anxiety and solicitude of Mrs. Winton that Mr. Winton recently announced his retirement from racing. Mrs. Winton always expressed a deep interest in racing, but she feared that her husband would suffer some injury.

An enterprising Minneapolis electrician recently used his big yellow automobile to carry devotees of the national game of base ball to the Twentieth Street grounds, charging a nominal fare for the service.

THE AUTOMOBILE

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SATURDAY, SEPTEMBER 5, 1903.

THE SELDEN PATENT SITUATION.

If, as now seems probable, the Selden patent is to be made the subject of a determined legal battle, it is to be hoped in the interests of all concerned that a final decision will be reached as soon as possible. Whatever rights justly inhere in this much-debated instrument should of course accrue in full to its owners; and the plan of the latter, to legalize under the patent the product of responsible manufacturers, is seen to be a much more liberal construction of a monopolistic advantage than is altogether the fashion nowadays.

If, on the contrary, as its opponents claim, an invalid patent is being put forward for the sole purpose of forming an automobile "trust," the movement will deserve defeat. An automobile trust, if such a thing is desirable on any terms, should be advocated on the ground of public rather than of private advantage. In any case, a decision from the highest court will clear the air for both maker and user, and the present determination of both parties to the controversy indicates that such a decision is likely to be sought.

PREVENTING BACK KICK.

Isn't it about time that some one—not a genius, but just a man with ordinary horse sense—invented a device making it impossible to crank a motor with the spark

advanced? Nearly every motorist knows some one who has suffered a sprained wrist or had a bruise, if nothing worse, as the result of forgetting to retard the spark; and the examples of these unfortunates have served as profitable warnings to their friends. But to shift the spark is such a little thing to do, and forgetting is so fatally easy! Only the other day the death of a Detroit man was reported, due to a blow over the heart from the treacherous starting crank.

There are various cars with centrifugal governors to advance the spark; but, even without a governor, comparative safety may be had. A car described in these columns last winter has a connection between the tilting steering column and the spark lead, which retards the latter when the column is tilted forward for exit from the car. Every starting crank has a ratchet release, and engagement of the latter might be made to retard the spark. Opening the relief cocks, if the engine is a large one, could be made to perform the same function. So could releasing the clutch, which in some ways is the most practical method of all. There are ways enough: a little energy and a proper sense of responsibility are all that is needed.

FLYWHEEL CLUTCH IMPROVEMENT.

In the course of some remarks concerning the flywheel clutch, in our issue of June 13 last, it was pointed out that two desiderata of this form of clutch have, thus far been rather imperfectly secured,—namely, gradual engagement and extreme lightness in the member connected to the gear shaft; and it was suggested that it might be necessary to look for them to some other form than the familiar leather-faced conical clutch.

Although the purpose of Professor Hele-Shaw, in designing the very interesting clutch described on another page, was primarily to secure ability to slip continuously without injury, still it is noteworthy that both the other requirements mentioned above have been secured, incidentally but in high degree. The first of these—gradual engagement—comes of necessity from the ability to slip without cutting; the second is due to the fact that the rubbing parts are stamped sheet-metal discs, of very light weight and of relatively small diameter. The bath of oil in which they run, coupled with a form of disc which allows this oil free circulation, contributes to and largely accounts for both properties.

The value of the oil bath as a preservative, indeed, has long been recognized by other clutch makers. Many expanding ring clutches have it; and in particular the type of clutch referred to by Professor Hele-Shaw as the Weston, which we understand to be used on this side in the Welch and Eldredge cars, is adapted to its use.

It is interesting further to note that both of these requirements are well considered in the new Jenatzy magnetic clutch, also described in this issue. The Jenatzy

clutch is less original and more complex than the Hele-Shaw, and it has the essential though possibly not serious fault of demanding a constant expenditure of power for its engagement; but it shows an intelligent regard for the safety of the gears, and in engagement it is even more beautifully flexible. Probably the original reason for using the claw clutch release between the armature and its shaft was that the former is necessarily heavier than the corresponding member of the cone clutch, both because of its material (iron instead of aluminum) and because it must have thickness enough to complete adequately the magnetic circuit. Whatever the intention, the shock of changing gears is divided between the gears and the clutch claws, to the great advantage of the former.

Whatever device is used to obtain it, the removal of this shock from the gears enables the latter to be lightened, since it is that shock, more than the normal driving load, which wears and strips the teeth, and from which they must be proportioned.

THE AUTO OR THE COW.

That the automobile, with all its virtues, is grievously misunderstood, is a fact which its friends are seldom allowed to forget. It is not often, however, that that fact is so strikingly demonstrated as by a remark casually let fall by a Detroit physician a few days ago.

This gentleman, whose name is E. J. Kendall, has lately come into the possession of \$1,856, due him from the city for medical services. Incredible as it may seem, he is now debating whether to exchange his coin for an automobile or for a Jersey cow; and a reporter of the Detroit *News* quotes him as inclining toward the cow, on the trivial ground that she would be "safer."

Now, we are not going foolishly to deny that there may, in the remote past before the tonneau appeared and when men who pushed bicycles by leg power were not understood to be victims of incipient paresis, have been automobiles in which a country doctor might have expected to reach his patients somewhat less promptly than a cow—even a cheap and inferior animal—could take him, and which were much less safe as well. But even a Detroiter ought to understand by this time that that was a purely temporary condition. The horseless carriage problem of to-day is not to be solved by any cow; and he who, distrusting the artistic but unreliable equine, elects to trust his anatomy to the less imaginative animal, will have need of such infinite repose of soul as Brahma himself might not blush to own, and of an allowance of spare time equally beyond calculation.

And, now that we think of it, we really know of no reason why we should even concede the cow to be safer than the modern vehicle, at least when the modern vehicle is around. If the horse occasionally

runs away from the latter, the cow rather frequently gets in front of it; and with automobiles multiplying so much faster than cows, we would much rather be in the auto on such occasions than behind the cow. We don't know much about Detroit, though we have an idea that people there enjoy more leisure and a closer intimacy with live stock than we can claim; but nevertheless we are not without hope that the representative citizen we have quoted will reconsider his choice and "fall in line."

* * * *

Ex-Senator Ingalls, of Kansas, knew whereof he spoke when he characterized the purification of politics as an "iridescent dream." The women of Kansas are being treated to free rides to the polls per automobile. What woman (of Kansas) could resist such an argument?

* * * *

Universal sorrow and sympathy will be felt for Mr. Alexander Winton in his bereavement through the untimely death of his wife. The circumstances were such as to make it peculiarly painful, and many to whom Mr. Winton has heretofore been only the successful man of affairs will, on hearing of his loss, feel for him a quicker heartbeat of human regard.

* * * *

It has been pointed out that when the body springs of an automobile break the fracture is caused, not by the compression, which is supported by all the leaves, but by the rebound, which, if it extends beyond the free position of the spring, is supported by the upper or longest leaf alone. On bad roads and at high speeds this may very easily happen, and some users guard against it by using leather straps to prevent the springs from opening too wide. As this is a rather unmechanical expedient, it would seem as if some form of clip might be devised for the ends of the shorter leaves, which would allow free slippage of the leaves while preventing them from opening.

* * * *

Although the point does not appear to be specifically covered in the rules for the N. A. A. M. endurance run, the intention seems to be that on arriving at a night control vehicles shall be run immediately into the garage, where no work may be done on them except shutting cocks and filling tanks, without penalization. Such repairs as one requires must be made either on the road or in the garage, under time penalty in either case. This penalty, apparently, will extend even to washing and the cleaning of chains, to freeing the pistons with kerosene, testing the spark circuits, and oiling detached bearings. As these are things which every tourist must do to keep his car in order, penalizing them like breakdowns seems needlessly severe.

Rush for Licenses Swamps Boston Office.

Special Correspondence.

BOSTON, Sept. 1.—All sorts of annoyance marked the first day under the new registration and license law for automobiles in Massachusetts. Most of them were due to the fact that a great number of operators and motorists put off applying for their papers until the last minute and then had to wait two or three days for the Highway Commission's clerks to reach their applications in regular order. Some of the troubles were due to the failure of express companies to distribute promptly the sets of number plates sent out by the commission. Many others were due to ignorance of the law and its requirements on the part of applicants, or their neglect to answer all the questions in the application blanks. Neglect of this sort meant that the papers went back to the applicants to be filled out completely and definitely. The only persons who were not subjected to annoyance were those who took time by the forelock and filled out their application blanks some time before September 1, so that they were among the first to whom the commission sent out plates. These were riding around town to-day displaying the inoffensive strips of blue enamel with white numbers four inches high.

The tardy applicants were thrown into consternation last night and this morning on finding that their numbers could not be sent to them for two or three days, as 300 or 400 applications were filed in the office in a bunch at the eleventh hour. However, the local police are acting with leniency. Officers of the Back Bay station in the district where automobiles are most numerous in Boston, said this morning that no arrests would be made during the next two or three days of those who fail to exhibit a number, provided the occupant of the car could show one of the card receipts from the Highway Commission denoting that he had applied for registration in due form and had paid his fees.

Up to noon of to-day, the Commission's clerks had received 2,510 applications for personal licenses to operate, 2,147 for certificates of registration, about 120 for motor cycle registration, and forty-four for licenses for dealers and manufacturers. Under this last class any number of demonstration machines and machines for sale may be run under a single number designating the garage to which the machine belongs. About 1,680 number plates had been sent out, and no others could be started until the rush of applications had moderated sufficiently to allow the clerks to list about 300 license applications and 200 registration papers, which remained over from the rush of August 31, when the office was kept open until 10 o'clock in the evening, and a string of special delivery post office boys stood in line on the

stairways most of the time. Monday's business brought in \$1,056 in fees. As the mail, after the law went into effect to-day, brought in about 150 other applications, and there was a crowd of people applying in person during the entire forenoon, it will be a week yet before the rush is over and the clerks have caught up with the applications. Only one was on duty at first; now, for the rush times, there are twelve.

A Pennsylvanian who had been summering in Maine made a great stir in the office early this morning. He had taken his automobile with him to his summer home, and not until he started home had he found that a new law was "on" in Massachusetts. He tore into the office in great excitement, demanded all the papers necessary for immediate use, saying that he wanted a number plate immediately. When told that he would have to wait his turn, and that several hundred were ahead of him, he broke forth into invective, and said things about the Bay State and its law-makers which betokened choler and undue haste in speech. In the course of his exclamations, however, he let drop the information that his chauffeur was licensed in his home State, while his machine was already tagged with the registration numbers of New York and New Jersey. Then the wrinkles smoothed themselves out of the faces of the clerks, and in the first moment of calm they made him understand that the Massachusetts law, which he had been so earnestly reviling required absolutely nothing of him so long as he had his man and his machine duly enrolled under State authority elsewhere. But he left the office still steaming.

Four Days' Grace for Washington Motorists.

Special Correspondence.

WASHINGTON, D. C., Aug. 29.—The new automobile regulations for the District of Columbia, formulated by the District Commissioners, went into effect to-day. They were in force for just twelve hours, when an order was received at police headquarters to suspend further enforcement until September 2. Inquiry brought out the fact that these added days of grace were given to allow all automobile owners and operators a final opportunity to register and secure their licenses and numbers. It was stated at the municipal building that on Wednesday next the regulations will positively become operative, and all automobileists who fail to comply with them must then expect to suffer the penalties prescribed.

Licenses for 253 vehicles and 284 operators have been granted to date. As there are more than 500 automobiles in daily use in Washington, there is likely to be a scramble for licenses at the last moment.

Multitude of Fall Race Meets.

Dates of Forthcoming American and Foreign Events.

Sept. 6-13—Automobile Week at Vienna, Austria.
 Sept. 7-8—Track Races at Grosse Pointe, Detroit Automobile Racing Association.
 Sept. 9—Races at Wisconsin State Fair, Milwaukee.
 Sept. 7-10—Race Meet at Nassau, N. H., Annual Fair.
 Sept. 12—Races at New York State Fair, Automobile Club of Syracuse.
 Sept. 18-26—One Thousand-mile Reliability Trials, England, A.C. of G. B. & I.
 Sept. 19—Race Meet at Providence, Rhode Island Automobile Club.
 Oct. 2—Race Meet at Brighton Beach, Long Island, L.I.A.C.
 Oct. 3—Race Meet at Empire City Track, Yonkers, N. Y.
 Oct. 5-10—French Trials of Passenger and Delivery Vehicles for Town and Country Service.
 Oct. 6—Weighing in for N. A. A. M. Reliability Run to Cleveland and Pittsburg.
 Oct. 7—Start of Reliability Run from New York.
 Oct. 10—Race Meet at Point Breeze Park, Philadelphia, Philadelphia Automobile Club.
 Oct. 14—Arrival of Cars in Pittsburg.
 Oct. 15—Brake and Hill-Climbing Tests at Schenley Park, in Pittsburg.
 Oct. 16—and following days—Examination of Cars.
 Oct. 16-17—Race Meet at Matsue Park, Pittsburg, Pittsburg Automobile Club.
 Dec. 10-25—Fifth Annual Paris Automobile Exhibition.
 Jan. 25-Feb. 6—Florida East Coast Tournament, Daytona Beach, Fla.

FEATURES OF SEPTEMBER 12 RACES AT NEW YORK STATE FAIR.

The series of automobile races to be held in Syracuse on Saturday, September 12, under the auspices of the New York State Fair Association and the Automobile Club of Syracuse, gives assurances of bringing together some very prominent foreign and American racing experts. Interest centers in a special three-cornered match race between Jules Sincholle, 40-horsepower Darracq; F. A. La Roche, 40-horsepower Darracq, and Henri Page, 40-horsepower Decauville.

Other events include:

Two miles for motor bicycles, regular stock machines; five miles for cars all weights, supplies included, under 1,200 pounds, all motive powers; five miles for Winton touring cars, stock models with tonneau attached; ten miles for cars all weights, supplies included, under 1,800 pounds, all motive powers; five-mile handicap for club members only, each car to have regular road equipment; five miles for Franklin cars, regular stock models; fifteen miles, open to all; one mile record trials.

The course is the regulation mile track, 100 feet wide. The first race will start at 2 P. M. sharp. All races will be from a flying start, except that for club members only. First prizes only will be given, and they will be sterling silver cups of special design.

Entries close September 9 with C. A. Benjamin, Syracuse, N. Y.

The new State Fair track, where the races are to be held, has been put into perfect condition, and local interest in the series is especially keen, some exceptionally fast time being anticipated. A number of visiting automobile parties are being made up and the automobile clubs of Buffalo, Binghamton, Utica, Albany and Courtland are to be well represented at the races.

Private Races at Newport.

Special Correspondence.

NEWPORT, Aug. 31.—As W. K. Vanderbilt, Jr., has failed to put in an appearance here this season, no races will be held by

the National Racing Association of Newport, of which association Mr. Vanderbilt is president. However, W. Mason Turner, who has managed the races heretofore with Mr. Vanderbilt for the association, has suggested the idea of holding private automobile races, the entries to be made by invitation and confined strictly to the cottagers here who own fast machines.

Besides making the entries exclusive, the officials will be prominent society men. Harry Lehr has been requested to act as starter, while others equally popular will sell programs, collect tickets and act as judges, timers and assume other duties necessary at such events.

The races will be held the second week in September on the half-mile track at Aquidneck Park, three miles from town.

Program for Detroit Race Meet.

The third annual meet of the Detroit Automobile Racing Association, which is to be held under the auspices of the Detroit Automobile Club, will take place on the Grosse Pointe track, Detroit, on Monday and Tuesday, September 7 and 8. The track is one of the fastest mile tracks in this country and some very interesting contests are anticipated.

On Labor Day, September 7, the following races, which will comprise the first day's series of events, are to be held:

Five-mile open, weight limit 1,000 pounds; five-mile open, weight limit 2,000 pounds; five-mile special for Detroit owners, cars to have full road equipment and carry four passengers; five-mile special race for manufacturers' challenge cup; ten-mile open; five-mile special pursuit race (Oldfield vs. Cooper); one-mile open special electric race.

After these contests special record trials will close the events of the day.

On Tuesday, September 8, the program includes the following: Three-mile open, 800-pound weight limit; two-mile race for electric vehicles; five-mile open; five-mile special pursuit race (Oldfield vs. Cooper); ten-mile handicap, open, weight limit 1,800 pounds, three-minute class; ten-mile open. A series of special manufacturers,

record trials will close the events of the meet.

All the races scheduled on this interesting program will be from standing start, while the special record trials will be made from flying starts. First prizes only will be awarded, and they will include especially-designed silver cups valued from \$75 to \$200.

Race Meet in Chicago on September 26.

Special Correspondence.

CHICAGO, Aug. 29.—The Chicago Automobile Club has taken steps to assure a great automobile race meet to be held on the Washington Park track on Saturday, September 26, and arrangements already have been concluded with a number of professional and amateur racing men, who have agreed to bring their powerful racing machines.

Members of the club held a meeting last Thursday, President Charles W. Gray, presiding, to hear a report from a special committee which has been asked to call on the Washington Park management with the object of securing a definite date, and it was announced that arrangements could be concluded to hold the meet on September 26, the last Saturday in the month of September. It was thought that at least two days should be devoted to the contests, and on motion of one of the members of the club it was voted to co-operate with the management of the centennial celebration in arranging the final details of the meet. The following committee was then appointed to take the matter in hand: Charles W. Gray; Charles H. Tucker and John Farson. A five-mile match race will be the leading event of the meet. In addition to Tom Cooper and Barney Oldfield, it is anticipated that arrangements can be made with L. P. Mooers to enter his big Peerless racer, and Carl Fisher and Earl Kiser will be on hand with their 80-horsepower Mohawks.

Empire City Track Races October 3.

For the third time this season the Empire City track at Yonkers, N. Y., is to be the scene of an automobile race meet, and it is anticipated that a number of present track records will go by the board on Saturday, October 3, the day of the final automobile event of the season on that exceptionally fast oval.

The meeting, which has lately received the sanction of the American Automobile Association, follows the regular automobile circuit, and it will be held just three days prior to the weighing in of the cars entered in the N. A. A. M.'s endurance run to Cleveland and Pittsburg. The program includes six regular events, a number of special match races, particulars of which have not been announced, and a race exclusively for motor bicycles. Silver trophies will be awarded to the first and second competitor in each event.

The management of the Empire City Trotting Club, has offered inducements to prominent foreign road racers, including such well-known professionals as Jenatzy, Gabriel and Charles Jarrott, although it is doubtful if they will attend. In the absence of a foreign contingent as an attraction, some interesting races are promised between Oldfield, Cooper, Owen, Mooers and others. Oldfield will drive one of the eight-cylinder Winton machines and Cooper, the Ford-Cooper "999," while Mooers will probably assail the record with his Gordon Bennett Peerless racer, which was driven by Wridgway at the last meet on the Empire City track on July 25.

Entry blanks for the open events can be obtained from Alfred Reeves, Secretary, 5 West 66th Street, N. Y. City.

Wisconsin State Fair Races on September 9.

Special Correspondence.

MILWAUKEE, Aug. 29.—Plans have been laid for the first public automobile race to be held in Milwaukee in connection with the Wisconsin State Fair on Wednesday, September 10. The program will include two amateur and one professional event. An appropriation of \$1,000 has been made by the State Board of Agriculture, having charge of the fair, for the race, and this money will be divided into prizes and purses. Medals will be offered for the winners of the amateur events, \$250 having been set aside for their purchase. The remaining \$750 will be put up for the winners of the professional event. The entry fees of \$5 and \$10 will be refunded to those who actually start.

An effort will be made by the Milwaukee Automobile Club, which is taking an active interest in the event, to have some of the foremost American racers entered. Correspondence is being held with Alexander Winton, Percy Owen and others, and it is thought replies will be received in a few days to make it possible to complete the plans.

Revised Program for Providence Races.

A number of important changes in the list of events for the automobile races to be held at Narragansett Park, Providence, R. I., were made by the committee of arrangements of the Rhode Island Automobile Club, at a special meeting held on Friday, August 28.

The first five-mile event, which is for gasoline cars weighing 1,200 pounds or under, remains unchanged, while the second event, a five-mile race, is now open to all types of vehicles weighing 1,800 pounds or under. The other events are as follows: ten miles, all motive powers, all weights; three-mile race for steam vehicles, no weight restriction; two-mile open for electric vehicles; five-mile race for single motor bicycles.

Barney Oldfield will probably drive Winton's eight-cylinder Gordon Bennett car, and the appearance of L. P. Mooers,

in his big four-cylinder Peerless Gordon Bennett competitor has also been secured.

To accommodate the large number of automobile parties which are expected to attend the races, spaces for their vehicles directly in front of the grandstand, in the quarter stretch, will be sold, affording the occupants of the cars an excellent view of the races.

Planning First Missouri Valley Meet.

Special Correspondence.

KANSAS CITY, Mo., Aug. 29.—The Automobile Club of Kansas City will hold a race meet on the track of the Kansas City Driving Club on some day between October 1 and 10. The exact date will be chosen in a few days. The meet will be the first of its kind ever held in the Missouri Valley, and it is expected that it will be attended by motorists from the East as well as from all parts of the Middle West. The club will entertain the Interstate Automobile Association, which will be represented by members from St. Joseph, Atchison, Topeka, Lawrence and other nearby points.

According to present plans there will be about fifteen events, some of them for professionals, but no cash prizes will be given. The plan to have Barney Oldfield here has practically been abandoned, largely because the club thought the expense would be too great. It is hoped, however, that several makers will see their way clear to send machines not now represented here, a feature that would serve as a miniature show.

L. C. Boyle, ex-attorney general of the State of Kansas, has been retained by the club as legal adviser. He will confer with the city officials in regard to the ordinance regulating the use of automobiles, which is now being drawn. Mr. Boyle is to represent the club both individually and collectively in any matters requiring his services, such as damage suits and similar proceedings.

Ten new members were taken into the club Saturday night.

C. J. GLIDDEN'S SUCCESSFUL TOURS INFLUENCE OTHER BOSTONIANS.

Special Correspondence.

BOSTON, Aug. 31.—If Charles J. Glidden's recent long tours through Europe have not set the Boston automobilists on edge with ambition to go and do likewise or better, some other influence has done so, for many are about to start singly or in groups to have a try at the fine roads and new scenes of the continent across the water.

One of the most expert operators in Boston, George Gordon Reed, is booked to leave by steamer from New York on September 15. His machine, a handsome new Knox was shipped by Boston boat for Hamburg to-day, and will be awaiting him when he arrives on the other side. Mr. Reed has been prominent in every

recent Boston show and exhibition. His trip will include all the central touring country of Europe. He will be accompanied by Arthur M. Keith.

Among the other New Englanders who are now about to start on automobile trips in Europe are Major and Mrs. O. W. Story, who will take a steam touring car and be gone about two months; L. C. Spaulding and his brother, R. H. Spaulding, of Rochester, N. H., who start this week by Dominion Line steamer and plan a drive from Liverpool to Manchester, Leicester, Northampton, Bristol, London; then a trip across to Germany, France, and Italy, returning to Boston in about seven weeks. Mr. Spaulding's chauffeur, H. H. Colson, will accompany them.

As for Mr. Glidden, Boston papers erroneously printed his date for crossing the Arctic Circle in his Napier car August 2. A postal card schedule, sent by him personally to THE AUTOMOBILE correspondent in this city this week, gives these figures:

"Aug. 16, 1903. Crossed Arctic Circle 2 P. M. to-day. Drove 3,590 miles, 32 days, 198 hours; 1,540 miles in Sweden. Very bad roads in Sweden."

This made a continuous run, except for waterways, from the Massachusetts Automobile Clubhouse, in Boston, through Ireland and England and the North of Europe to the region of the Northern Lights, with, as Mr. Glidden himself gave notice by correspondence, "no delays; 199 hours on the road; only 38 hours of rain; one puncture; and no money spent for repairs."

A. C. A. Tour to Boston and Return set for September 25 to 30.

It has been definitely decided that the fall tour of the Automobile Club of America, which is to take the place of its previous annual endurance contest and take the form of a "go-as-you-please" run to Boston, will start on the morning of Friday, September 25, from Central Park Plaza, New York. The members are scheduled to arrive in Boston on the evening of the following day, the termination of the first day's run being Hartford, Conn. Sunday, September 27, will be devoted to a tour of Boston and its interesting suburbs, and on Monday the return journey will be made to Springfield, Mass. On Tuesday the tourists will proceed through the village of Lee, and other towns *en route*, to Great Barrington, in the Berkshire Hills, and on Wednesday will push through to Poughkeepsie, and from there down the east bank of the Hudson to New York, arriving home on the evening of September 30.

It is anticipated that the members of the club will be entertained while in Boston by the Massachusetts Automobile Club. Final details for the run which have been left to the Runs and Tours Committee of the A. C. A. will be announced in a circular issued to the members in the near future.

PLAN TO INDEMNIFY AGAINST SELDEN SUITS.

GUARANTEE FOR INDEPENDENTS.

Contract Blanks Mailed to Unlicensed Manufacturers by Patent Title and Guarantee Co. Provide for Legal Defense and Payment of Possible Royalties and Damages.

Following close upon the recent meeting of the Association of Licensed Automobile Manufacturers held at Niagara Falls, at which the first long step toward effecting control of the American gasoline automobile industry was taken, came the interesting announcement that the Patent Title and Guarantee Company, of New York, had made preparations to enter the arena as the champion of the independent or unlicensed manufacturers, this step having been decided on at a meeting of its directors held in New York on Wednesday, August 26.

At that meeting it was decided to issue a contract form covering the features of the proposed service, for the benefit of the unlicensed gasoline automobile manufacturers. Subsequently this form was drafted and printed in blank and copies were mailed on Saturday, August 29, not only to independent manufacturers of complete vehicles, but to part makers as well.

The wording of the blank is as follows:

WHEREAS, on or about November 5, 1895, United States Letters Patent No. 549,160 were granted to Geo. B. Selden for an improvement in.....; and

WHEREAS, is desirous of securing protection against loss and litigation growing out of claims of infringement of the aforesaid patent, and also provision for the legal defense of any actions growing out of such claim or claims,

Now THEREFORE, in consideration of the premises and Dollars, and of the stipulation herein contained, the Patent and Guarantee Title Company (hereinafter called the Company) hereby guarantees..... of against all loss or liability under any judgment under the aforesaid patent growing out of the manufacture, sale or use by said of gasoline automobiles, upon the following stipulations and conditions, to an amount not exceeding..... Dollars

1. The said....., upon receipt of any notice or warning from any individuals, firm or corporation claiming any right under the patent aforesaid, against the manufacture, sale or use of gasoline automobiles, shall forthwith transmit and deliver the same to the Company at its office in the City of New York, with full information as to the time and manner of the receipt of such notice or warning.

2. The said....., upon receipt of a Subpoena, Bill of Complaint, Declaration or other notice of the institution of a suit for the infringement of said United States Patent by reason of the sale, use or manufacture of the articles above described, shall forthwith transmit and deliver to the Company such Subpoena, Bill of Complaint, Declaration or other notice, with full information as to the time, place and manner of the receipt of same.

3. The Company agrees that on receiving such Subpoena, Bill of Complaint, Declaration or other notice and information as aforesaid, it will, through its attorneys or counsel, appear in defense of said suit and will manage and conduct the defense of said suit on behalf of the said..... during the existence of this agreement.

4. This contract shall continue in full force and effect up to and including the first day of 1903, and may thereafter be continued in force

during the life of the patent aforesaid, or any portion thereof, by the quarterly payment in advance to the Company by the said..... Dollars on or before each succeeding..... subsequent to the date thereof.

5. In the event of a default in any of the said quarterly payments on any of the days above provided, this agreement shall thereupon cease and become null and void and all obligations thereunder on the part of the Company shall be terminated, anything hereinbefore to the contrary notwithstanding.

IN WITNESS WHEREOF, the Patent Title and Guarantee Company has caused this contract to be duly executed at the City of New York, this..... day of....., 1903, but this contract shall not be binding upon the Company until countersigned by the General Managers.

This contract blank, when properly executed, together with the attending agreement entered into between an unlicensed manufacturer and the Patent Title and Guarantee Company, provides, first, that the Guarantee Company shall defend its client against litigation brought under the Selden patent at any time; and, second, that in case such litigation is decided against its client, the Guarantee Company shall indemnify him for all royalties and damages recovered under the Selden patent, as a result of such action, to the full amount for which the contract is written. As payment for agreeing to perform such services the Guarantee Company requires a retainer of \$500, payable when the contract is signed, and a further quarterly fee of 5 per cent. of the amount of indemnity specified in the contract.

The protecting firm cannot guarantee indemnity against loss by its client in event of a court of law sustaining the Selden patent and denying the right of a maker to whom a license had been refused to continue manufacturing gasoline automobiles, but the contention is made that such decision would never be rendered, and, even if it were, that a court of equity would probably not sustain it.

Contrary to reports published in the daily press, the Patent Title and Guarantee Company, which is a successful organization of five years' standing, has no intention of attempting to form a defensive association of unlicensed automobile manufacturers, such a step being considered inadvisable. It is pointed out that should a judgment be rendered against any member of such an organization it would bind all of its individual members, provided the association, as a unit, assumed the defense.

Associated with the Guarantee Company, and, in fact, the moving spirit in the present enterprise, is Walter H. Chamberlin, head of the Chicago law firm of Chamberlin & Wilkinson, well-known attorneys, who are, and have been in the past, regularly retained as patent solicitors by a number of unlicensed automobile manufacturers, among the number being one of the largest and most successful builders of light gasoline vehicles in the country, whose plant in the middle west has turned out between 3,000 and 4,000 vehicles during the present season. Mr. Chamberlin, who was assistant Commissioner of Patents at

Washington under the McKinley administration, has devoted considerable time to automobile patents in behalf of his clients. He is a prominent member of the Chicago Automobile Club, and well known in trade and professional circles in the Windy City.

Mr. Chamberlin believes that the most serious outcome of a successful Selden patent suit would be that a defendant company might be forced to pay a royalty to the owners of the patent. It will undoubtedly remain for the courts to decide the validity of the patent, which was endorsed by the Commissioner of Patents at Washington, in his annual report for the year 1896, published in the Official Patent Office Gazette for May 12 of that year. The patent as it stands is very broad, and may be considered as the pioneer invention in the application of the compression gas engine to road or horseless carriage use.

CLEVELAND DEALERS ASKED TO SIGN A. L. A. M. "EXCLUSIVE" CONTRACT.

Special Correspondence.

CLEVELAND, Aug. 28.—One of the leading automobile dealers has been requested by the Association of Licensed Automobile Manufacturers to sign a contract agreeing to handle only the goods of the licensed manufacturers. It is stated that the contract also provides that the dealer shall not handle or buy goods manufactured by parts makers who sell to outside manufacturers. It is also understood that by the contract the dealer agrees to submit a monthly report of all automobiles sold, together with the names of owners and the license numbers. The dealer is not required to give a bond to carry out these conditions but it is understood that the various manufacturers are under bond to instantly sever relations with any dealer who does not live up to the terms of the agreement. Under these conditions, it seems practically impossible for a dealer to handle both "inside" and "outside" machines. So far as the dealer in question is concerned, he is satisfied with the arrangement, since he has never handled any of the "outside" makes, and under the circumstances he is well pleased as he believes the arrangement will do away with much undesirable competition.

The F. B. Stearns Co., one of the leading outside manufacturers, is preparing to purchase material for another season. The managers say they will take their chances of remaining in the business. The Stearns Co. has never aimed to do a very large business, preferring to manufacture a limited number of high-priced cars. Its output this year has been about twenty-five cars. The company has made a satisfactory profit and closes the season with a balance on the right side of the ledger. During the coming season the company will build cars of practically the same model as this year, a large roomy touring car, capable of carrying six passengers and equipped with a 24-horsepower horizontal, opposed, double-cylinder motor.

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